



**DRAFT—FOR REVIEW ONLY**  
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## **District of Columbia Motor Carrier Management and Threat Assessment Study *Phase II Preliminary Findings***



*Prepared for:*  
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## Table of Contents

<b>I. Introduction.....</b>	<b>1</b>
<b>II. Truck Route Recommendations.....</b>	<b>2</b>
<b>III. Pilot Truck Parking Study.....</b>	<b>10</b>
<b>IV. Security .....</b>	<b>16</b>
<b>V. Motor Carrier Office.....</b>	<b>49</b>
<b>VI. Recommendations Matrix .....</b>	<b>52</b>

## I. INTRODUCTION

This draft report presents results and recommendations from the District of Columbia Motor Carrier Management and Threat Assessment Study, commissioned by the District of Columbia Department of Transportation (DDOT) to the U.S. Department of Transportation's Volpe National Transportation Systems Center. This report covers Phase II of the two-part study. It includes a revised section on security procedures regarding trucks, a set of recommendations, along with the implications of each recommendation on various stakeholder groups, the environment, and security within the District. The report also includes a detailed recommendation for the creation of a Motor Carrier Office that would coordinate all truck-related issues for the District government, recommendations for the establishment of designated truck routes for truck travel in the District, and presents a prototype truck parking study.

This report draws heavily on the background material and preliminary recommendations presented in Phase I of the study.<sup>1</sup> The Phase I report includes an analysis of existing conditions of truck traffic in the District, along with an assessment of the needs and concerns of various stakeholder groups. The present report concentrates on better truck management in the District.

The District of Columbia is well positioned to benefit from better truck management. The growing demand for new housing and commercial space, and the uniquely complex set of security concerns, combined with the current limited truck management and security efforts, require that the District of Columbia re-consider and redefine its policies for the movement of trucks. This report provides the basis for the development of future truck policies.

This report begins by presenting a thorough assessment of security-relating concerns for truck traffic. This section includes a description of current security procedures, a discussion of outstanding practices from other cities, and presents some recommendation for improved security practices. The following section contains a matrix of various recommendations that could improve truck management in the District. The matrix shows the potential impacts each on stakeholder groups and the environment.

One key recommendation is the creation of a Motor Carrier Office within DDOT. This office would be a clearinghouse for truck-related issues. Section IV of this report describes such an office might do. The follow two sections contain detailed analyses of truck traffic. Section V provides a model for how the District of Columbia might create designated truck routes in order to keep trucks on roadways with design characteristics that are conducive to truck travel, and to avoid the problem of truck traffic on residential street. The final section of this report contains a detailed truck parking study in a small section of the downtown area. It provides ideas for how the District could better meet the needs of truck operators and businesses that receive deliveries, while reducing illegally parked vehicles.

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<sup>1</sup> The Phase I draft report can be obtained from the DDOT website at [http://ddot.dc.gov/information/studies/Motor\\_carrier\\_study/Preliminary\\_Draft.shtml](http://ddot.dc.gov/information/studies/Motor_carrier_study/Preliminary_Draft.shtml)

## II. TRUCK ROUTE RECOMMENDATIONS

Consider some of the most important concerns about truck traffic in the District of Columbia: noise and vibration complaints from residents; security concerns around at-risk facilities; poor roadway geometry or pavement condition; and double-parking. The creation of designated truck routes in the District can address these concerns simultaneously, albeit to varying degrees. This section makes recommendations about how to design a truck route network. A summary of the important traffic issues is presented below, followed by recommendation for a designated truck route system for the District.

### II.1 SUMMARY OF EXISTING TRUCK TRAFFIC CONDITIONS

Trucks constitute approximately five percent of the traffic in the District. However, truck traffic is not distributed uniformly throughout the District; on Georgia Avenue, for example, about 14 percent of traffic is trucks. Most truck traffic in the District is destined for locations within the District (rather than passing through the District) and consists primarily of 2-axle, 4- and 6-tire vehicles with a small percentage of larger and combination-type trucks on the major truck corridors.

Based on an analysis of data related to truck traffic and restrictions in the District and on interviews with various stakeholders, several important issues arise:

- ◆ The District of Columbia does not have designated or recommended truck routes.
- ◆ There are several roads that have restrictions on one side of the District border with Maryland or Virginia that are not consistent with truck restrictions on the other side of the border. This points toward the need for improved regional coordination of truck routes.
- ◆ Military Road is the only major east-west corridor suitable for trucks in the northern part of the District. This results in heavy truck traffic in this corridor, and generates complaints from area residents.
- ◆ The area directly south of the Beltway and north of the District between 16th Street and Georgia Avenue will become a major truck trip generator by the year 2015, based on land use projections.
- ◆ Many of the *de facto* truck routes in the city are characterized by inadequate roadway design and poor pavement conditions.
- ◆ Neighborhood residents object to truck traffic cutting through residential streets.
- ◆ Double-parked vehicles cause traffic tie-ups on many arterials, especially in Georgetown, Downtown, and the Golden Triangle.
- ◆ Many on-street loading zone parking restrictions are imposed only during the peak period, leaving trucks that arrive during off-peak times without exclusive loading zones.

In order to better manage truck travel in the District, a three-tiered system of truck routes could be created. Roadways in the District would have a designation based on roadway characteristics, types of trucks that use the corridor, congestion, and security concerns. Figure 1 shows the recommendation for how this three-tier system could be constructed.

**Figure 1. Truck Route Designation 3-Tier System**  
**IDENTIFICATION CRITERIA- ROAD CHARACTERISTICS RECOMMENDATION**

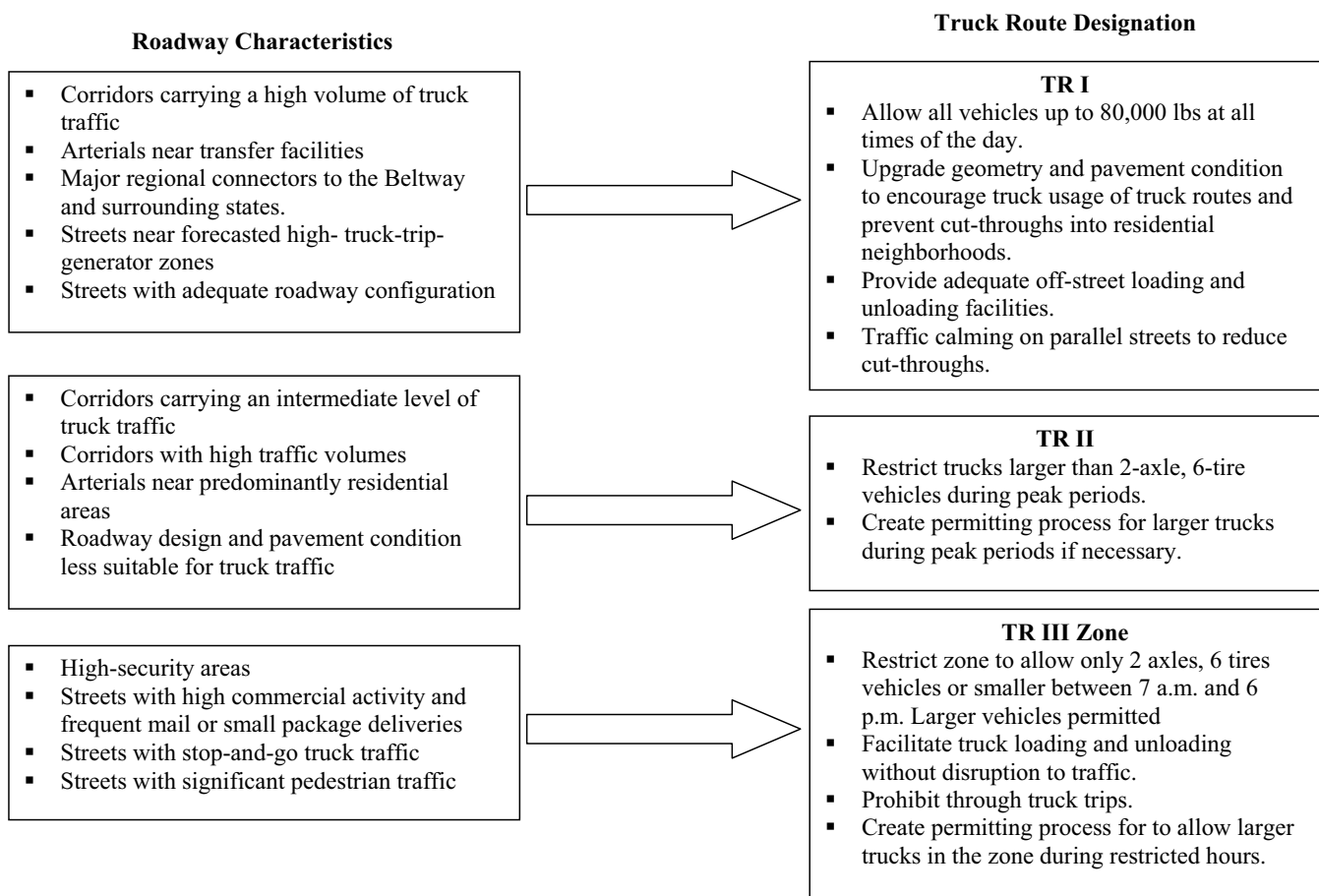


Figure 2 shows the roadways that make up this three-tier truck route system based on the above criteria. The truck route designations are discussed in more detail in the next section.

## II.2 TR I DESIGNATED ROADWAYS

The highest in the hierarchy of truck routes, termed TR I, are the corridors that are essential to the freight movement in the District. These roadways would have design characteristics that make them conducive to the movement of large trucks, thus encouraging trucks to use them and avoiding cut-throughs on residential streets.

The following roadways would be designated TR I:

1. Wisconsin Avenue NW, designated TR I NW, which turns in Maryland State Highway (SH) 355, connecting to the Capital Beltway.
2. Georgia Avenue NW, designated TR I North, which turns into U.S. 29 and then Maryland SH 97 linking to the Capital Beltway. About 15 percent of the vehicles on Georgia Avenue are trucks; more than 10 percent of these trucks are larger combination trucks. Also, this corridor also borders on a future major truck trip generation area based on land use forecasts.
3. New York Avenue, designated TR I East, which leads into the U.S. 50 connecting it to the Beltway. More than 12 percent of the trucks on this corridor are combination-type trucks. Also, it is near major transfer facilities, including FedEx.
4. Nebraska Avenue NW- Military Road-Missouri Avenue NW-South Dakota Avenue NE, designated TR I East-West. These roadways make up the east-west truck corridor connecting the northwest TR I (Wisconsin Avenue) to northeast TR I (New York Avenue). Although this route abuts residential areas, it is the only east-west roadway in the northern part of the District that can accommodate a large amount of large trucks.
5. I-395 connecting to the Beltway, designated TR I West. This corridor is designated a hazmat route<sup>2</sup> by the District of Columbia.
6. I-295-Anacostia Freeway-Kenilworth Avenue NE, designated TR I South. This is a hazmat route<sup>3</sup> providing a southeast corridor for truck traffic connecting directly to the Beltway. Further, this corridor borders a site that will be a major truck trip generator in the future base on land use forecasts.

All of the above roadways offer linkages to the Beltway and presently constitute a major part of the *de facto* truck routes used by truck drivers.

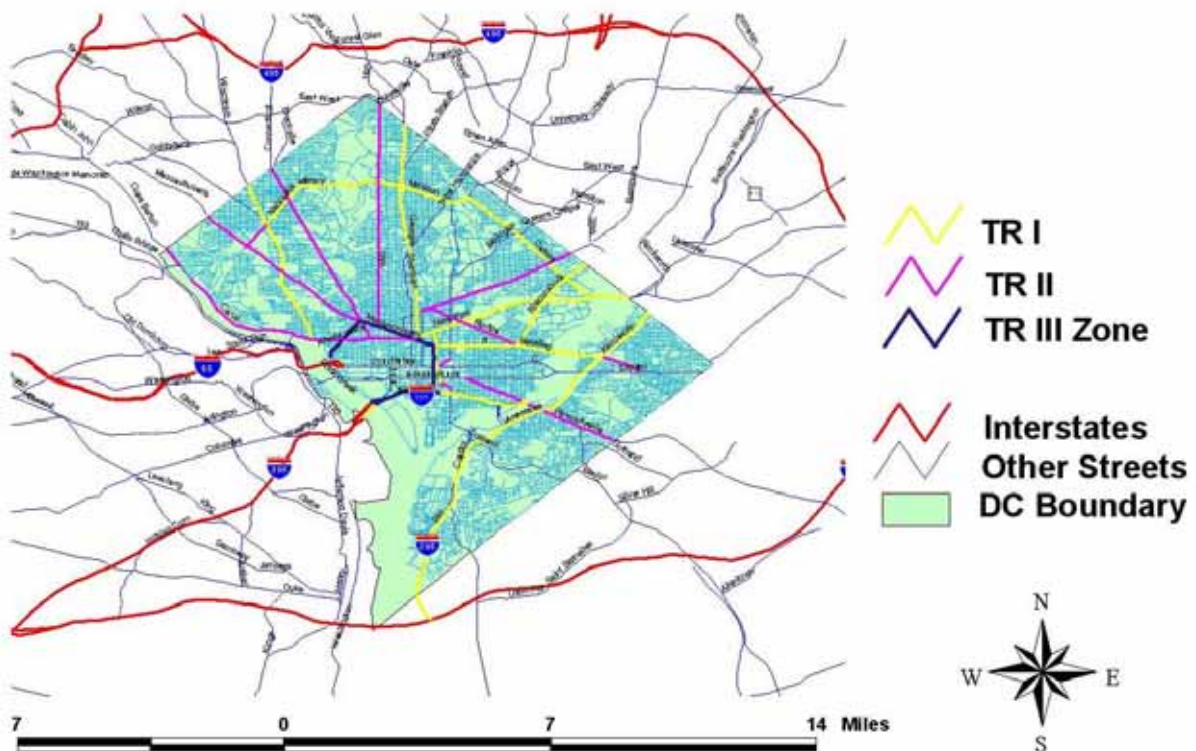
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<sup>2</sup> District of Columbia Municipal Regulations (DCMR), 1995, §1403.1(c).

<sup>3</sup> DCMR, 1995, §1403.1(c) and §1403.1(d).

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**Figure 2.**  
**Proposed Truck Route System**



### II.3 TR II DESIGNATED ROADWAYS

TR II designated roadways form the second tier of the truck route system. These roadways carry significant traffic but are less important for heavy truck traffic than TR I routes. Most of the roadways in this category have insufficient roadway geometry to accommodate heavy trucks; further, they border residential areas. The following roadways form a part of this group:

1. New Hampshire Avenue
2. North Capitol Street
3. South Capitol
4. 16th Street
5. Canal Road
6. Massachusetts Avenue
7. Connecticut Avenue
8. K Street
9. Benning Road
10. H Street
11. Florida Avenue
12. Pennsylvania Avenue
13. Bladensburg Road
14. Rhode Island Avenue

Large trucks (larger than 2 axle, 6 tire vehicles) would be restricted from using TR II roadways during the peak periods, 7 to 9:30 a.m. and 4:30 to 6:00 p.m.

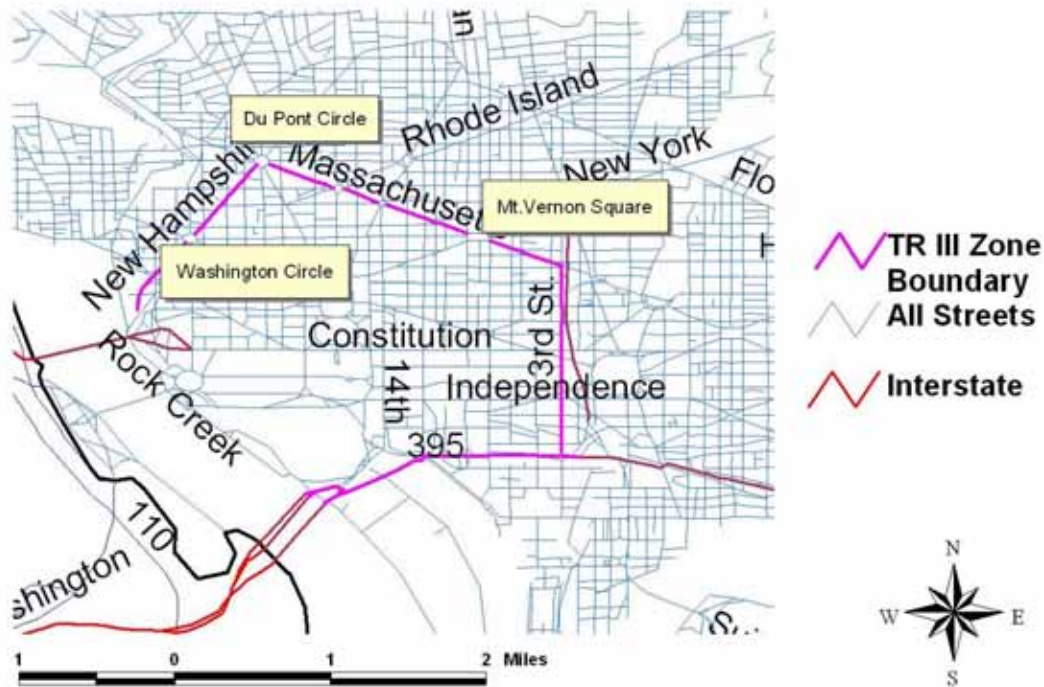
### II.4 TR III DESIGNATED ZONE

The TR III core high-security area was demarcated by overlaying sensitive locations as identified by the National Capital Planning Commissions with the commercial district in the Golden Triangle area.<sup>4</sup> The resulting area is bounded by New Hampshire Avenue in the northwest, Massachusetts Avenue in the northeast, I-395 in the south and southwest, 3<sup>rd</sup> Street in the west, and the Potomac River in the southeast, as shown in Figure 3.

The TR III zone would allow trucks larger than 2-axle, 6-tires vehicles to operate in the area only between the hours of 6 p.m. and 7 a.m. This is an important security consideration since dangerous cargo can be hidden in large trucks. These trucks would be more conspicuous at night when there are fewer vehicles on the road. Further, this restriction would alleviate traffic congestion due to large truck stop-and-go travel in this area. In addition, many larger trucks are unable to use alleyways, service lanes, or off-street loading docks for making deliveries because the vehicle is too small to maneuver into these small spaces. They then park on the main thoroughfare, blocking a traffic lane, leading to congestion. The goal of this restriction is to shift this large-truck traffic into nighttime hours. At present most large trucks operating in this area during the daytime hours are food and beverage deliveries, trash haulers, construction trucks, office movers, and gasoline trucks to a few gas stations. Many of these trips could possibly be made during the night. A permitting or credentialing system could be created whereby tour buses and transit vehicles are allowed within the cordon zone during daytime hours.

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<sup>4</sup> Further discussion of designation of secure areas can be found in Section IV of this report.

**Figure 3.****TR III Zone Boundary Zone**

This study did not address deliveries to the museums and National Park properties in the area. However, given the nature of these operations, it is safe to assume that most regular deliveries can be made in smaller trucks, and that the permitting process (described below) may be utilized for larger trucks when necessary. Deliveries made to the U.S. Mint and other secure locations have also not been taken into account. Since most of these locations are Federal government property and agencies, coordination with relevant Federal authorities would be necessary.

Implementation of the cordon zone restrictions might be eased by beginning with restrictions during the peak periods, for example, from 7 to 11 a.m. and 3 to 6 p.m. After truck owners, operators, and delivery recipients have become accustomed to these restrictions, the restricted hours can be extended to 7 a.m. through 6 p.m.

The three-tier designated truck route system presented here would encourage trucks to use major arterials for traversing the District, thereby discouraging them from using side streets and other roadways with inadequate geometry or pavement quality for large trucks. This would be beneficial to both truckers and residents. Truck operators would get reliable truck routes with roadway geometry and pavement condition adequate to accommodate large trucks. The ease in maneuverability on these larger roads could result in fewer truck accidents. At the same time,

residential neighborhoods would be isolated from large truck traffic. The peak hour restrictions would also permit smoother traffic movement in the major business district, thus alleviating congestion.

## **II.5 PERMITTING PROCESS**

In order to preserve the commercial vitality of the District and to accommodate the needs of special truck trips that conflict with the above restrictions, a permitting process is proposed. The main features of such a process would:

- ◆ Allow heavy truck trips that need to be made in the TR III zone by issuing permits for daytime operation within the TR III zone based on need. These permits can also include the provision for a security clearance when necessary.
- ◆ Permit routing of large-truck trips during peak hours on TR II roadways with a caveat ensuring that these trips have loading-unloading space that prevents disruption of traffic on these routes.
- ◆ Accommodate routing of construction-related trucks within the designated routes.
- ◆ Provide a permitting or credentialing system that allows tour buses and transit vehicles in the cordon zone during all hours.

## **II.6 STREETS WITHOUT A TRUCK ROUTE DESIGNATION**

All trucks larger than the Tier II limit of 2 axles, 6 tires would be restricted from veering off the designated truck routes unless the undesignated street is the only route available for the truck to reach its destination. This restriction would require clear and consistent signing to notify truck drivers of the regulations.

### III. PILOT TRUCK PARKING STUDY

There are a myriad of truck parking problems in downtown Washington, DC: insufficient loading zone space on- and off-street; loading spaces that are too small for large trucks to use; inconsistent enforcement of parking regulations, especially double-parking; low turnover in metered passenger-vehicle spaces; and time-of-day loading zone designations that do not coincide with heavy courier and truck deliveries. While it was outside the scope of this study to address specific problem spots, nonetheless, to gain a better understanding of parking and loading issues, the Volpe Center Study Team did a careful analysis of truck parking conditions on K Street between 16th and 21st Streets NW.

This area was chosen because of its importance as one of the main commercial and office districts of the city. The Golden Triangle has over 8,000 businesses, more than 600 national and international company headquarters, and more than 800 retail establishments. With the information from the study of this area, the Volpe Center Study Team was able to learn important characteristics of truck parking in Washington's busiest commercial area, and to come up with a list of recommendations for implementing a parking plan for the area, and perhaps for other parts of the city as well.

#### III.1 STUDY AREA CHARACTERISTICS

K Street between 16th and 21st Streets NW, hereafter referred to as the study area, is located directly northwest of the White House. It contains the FedEx World Service Center, several prominent banks, and some excellent restaurants. Transit access is available from the Farrugut North Metro Station on the corner of K Street and Connecticut Avenue. Parking garages are available throughout the area and many blocks have alleyways for off-street loading and unloading.

Most of the blocks in the study area have a mix of office and retail businesses, with the retail on the first floor and offices above. Figure 4 shows the street configuration, parking regulations, and commercial properties on K Street between Connecticut Avenue and 18th Street, a typical block in the study area.

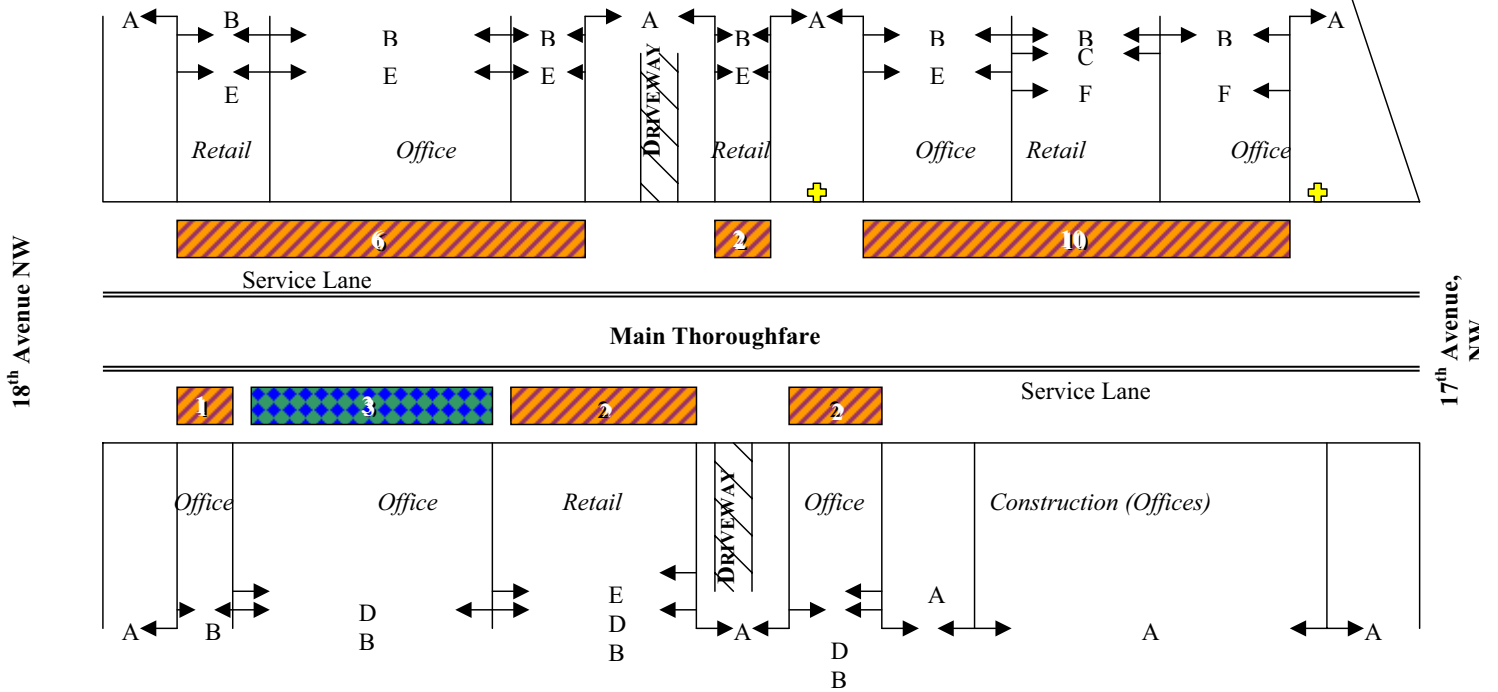
#### III.2 EXISTING PARKING INFRASTRUCTURE





On-street parking for passenger and commercial vehicles consists of metered spaces for passenger cars and free parking for commercial vehicles during the peak periods (7:00 to 9:30 a.m. and 4:30 to 6:00 p.m.). Many of the off-peak metered parking spaces for passenger vehicles are reserved for commercial vehicles only during the peak periods.

The signs on the curbsides provide two types of on-street spaces available for loading and unloading in the commercial area:

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**Figure 4. On-street Configuration – K Street NW between Connecticut Avenue NW and 18<sup>th</sup> Avenue**



	Type 1: Peak Loading/Unloading
	Type 1&2: 7 AM – 6:30 PM Loading/Unloading
	Fire Hydrant
	Restricted Area Indicated by Signage

**DETAIL: PARKING RESTRICTIONS & SIGNAGE**

- A – No Parking or Standing Anytime
- B – No Standing 7 – 9:30 AM or 4 – 6:30 PM, Mon – Fri, Except Commercial Vehicles
- C – No Parking Entrance 9:30 AM – 4 PM, Mon – Fri
- D – No Parking Loading Zone 9:30 AM – 4 PM, Mon – Fri
- E – 2-Hour Parking 9:30 AM – 4 PM, Mon – Fri
- F – 30-Minute Parking 9:30 AM – 4 PM, Mon – Fri

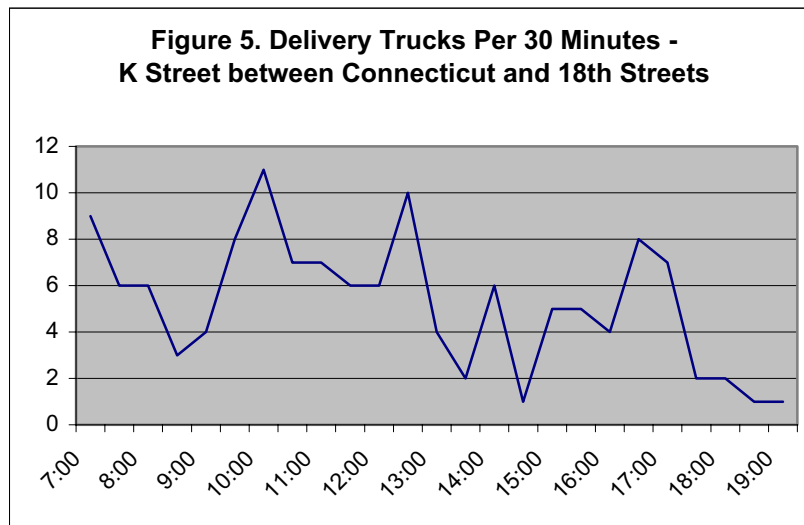
Type 1. *No standing except commercial vehicles from 7:00 to 9:30 a.m. and 4:30 to 6 p.m.*

Type 2. In addition to above, *No parking except loading and unloading 9:30 a.m. and 4:30 p.m.* The combination of these two restrictions results in parking reserved exclusively for commercial vehicles between 7:00 a.m. and 6:00 p.m.

Type 1 spaces become metered parking spaces for passenger vehicles in off-peak hours. Each block has 15-20 passenger car-sized metered spaces, resulting in about 150 Type I spaces in the study area. Type 2 spaces are governed by two different signs that prohibit parking by passenger vehicles during the peak periods (one sign) and in between the peak periods (another sign), resulting in an exclusive loading zone from 7 a.m. to 6 p.m. There is approximately one Type 2 space per block and eight for the entire study area.

### III.3 TRUCK BEHAVIOR OBSERVATIONS

The parking, and loading and unloading behavior of trucks was observed during a 12-hour period between 7:00 a.m. and 7:00 p.m. on a weekday. A total of 144 trucks entered and exited the study area during the observation period, for an average of about 12 trucks per hour. Figure 5 shows the number of trucks entering the study period during each 30-minute interval during the observation time.



The 12-hour observation period shows three distinct peaks:

- ◆ Morning peak around 10:00 a.m.
- ◆ Noontime peak around 12:30 p.m.
- ◆ Afternoon peak around 5:00 p.m.

Three kinds of truck trips were made to the study area: food and beverage deliveries, mail and courier service deliveries, and other services such as elevator repair vehicles. Table 1 contains the details of the truck trips: the number of trucks in each trip category, the average parked time for each truck, and the range of parking times observed.

**Table 1. Delivery Statistics for the Study Area**

Type of Trip	Number of Trucks	Average Parked Time (minutes)	Range (minutes)
Retail: Food and Beverage	22	12	2 – 74
Courier (USPS, FedEx, UPS)	42	20	1 – 105
Other	80	31	1 – 360
<b>Overall</b>	<b>144</b>	<b>28</b>	<b>1 – 360</b>

Courier vehicles and trucks delivering food and beverages were primarily 2-axle, 4- and 6-tire vehicles, with a few larger 3-axle trucks. The “other” category had a significant number of van-type trucks—2-axle, 4-tire vehicles.

Approximately 14 instances of parking violations were observed in the 12-hour observation period. These included parking on the main thoroughfare of K Street, parking on the median between the main thoroughfare and the service street, and double-parking such that traffic flow was severely affected.

More trucks entered the study period during the hour just after the morning peak period loading zone restrictions expired and during the lunch hour between noon and 1 p.m. than during any other hours of the day. Loading spaces were generally available for trucks during the morning peak because most metered spaces are reserved for loading zones during this time. However, after the morning peak period, significant congestion resulted from trucks that lacked parking spaces. Trucks trying to avoid peak period traffic need parking spaces available between the morning and afternoon peak periods in order to make their deliveries during this time. Thus, there appears to be a mismatch between the hours that trucks need parking spaces and existing parking restrictions.

Note that the commercial vehicle designation on the curbside signs allows spaces reserved for loading zones to be occupied by all vehicles with commercial license plates, regardless of whether they are loading and unloading goods. On-site observations revealed that many vans with commercial license plates block entire loading areas all day long. While this is technically legal, these vehicles did not contain goods that needed to be loaded or unloaded, thus reducing the number of spaces available for delivery vehicles. There is little turnover of these loading spaces for courier and other trucks needing loading spaces for short periods of time.

While each block in the study area had at least one Type 2 space, this seemed to be insufficient for the requirements associated with the businesses in the area. Additionally, there appeared to be inadequate turnover of these spaces, with commercial vehicles occupying them for long periods of time without actively loading or unloading goods.

Observations revealed that larger trucks (single unit 3- or 4-axle trucks) were unable (or found it too difficult) to park in side lane and alleyways, thus forcing them to block a traffic lane in order to make deliveries. This was one of the main problems during the afternoon off-peak hours.

### III.4 STAKEHOLDER PERSPECTIVES

In order to ensure that the needs of businesses and freight operators are not adversely affected by the recommendations resulting from this pilot parking study, major stakeholders were interviewed. With assistance from the Golden Triangle BID, the following groups were invited to participate in this study by providing their perspective on truck traffic in the study area:

- ◆ Property managers
- ◆ Retail owners
- ◆ Courier services

Each of the above groups said that the lack of adequate parking enforcement was one of the main problems in the office district. Too often, they find spaces reserved for loading and unloading occupied by passenger vehicles. Property managers further noted that most deliveries to their buildings take place in the alleyways. While the alleyways with an outlet are convenient for this purpose, other alleyways are extremely inconvenient because they require trucks to back out of the alleyway. Property managers mentioned plans for consolidated loading/unloading centers for each office block in order to alleviate truck parking problem and address security issues. Representatives from courier companies expressed a willingness to meet with building managers about this issue.

Additionally, property managers noted that District regulations prohibit private trash haulers from picking up trash before 7 a.m. This causes large trash trucks to come in during the peak hour to clear garbage in the morning.<sup>5</sup> This results in increased congestion during morning peak hours.

The stakeholders noted that there is very little short-term parking in the study area. Rather, parking spaces are usually occupied by the office employees parking for the entire day, feeding the meter every two hours. Interviewees felt that this defeated the purpose of the meter, which is intended to create short-term parking for shoppers and visitors.

Courier services mentioned that the morning peak was extremely important to them as most deliveries are made during this time period. While they felt that their quick delivery stops resulted in high turnover of parking spaces, they nonetheless felt that there simply are not enough parking spaces available to them, forcing drivers to park illegally. In some cases, drivers who want to park legally are forced to park up to two blocks away from their delivery destination. Representatives from courier companies said that they would be willing to pay a premium to insure that short-term parking spaces were available for their vehicles.

Retail stakeholders were concerned primarily with parking enforcement to ensure turnover in parking spaces so that their customers can find a convenient spot. They also noted that the morning peak was an important delivery time for them because most deliveries are made before noon. The retail representatives said that the delivery schedule was largely in the hands of the truck operators and felt they had little say in the matter. They also expressed concern that trucks sometimes tie up an alleyway for hours while making deliveries, waiting, or parking. This loading and unloading space is then not available for other deliveries.

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<sup>5</sup> City-owned or operated trash vehicles are allowed to pick up trash during the night.

### III.5 RECOMMENDATIONS

The following are recommendations for a parking plan based on conditions in the study area:

#### Short-term:

- ◆ Increase the number of dedicated loading-unloading spaces per block, both on- and off-street. One idea is to follow the Chicago's lead in requiring that one loading space be provided for every 100,000 square feet of commercial space.
- ◆ Expand morning parking restrictions to 11 a.m. to accommodate couriers and deliveries of perishable goods.
- ◆ Modify curbside signs so that loading zones are reserved for vehicles that are actively loading or unloading goods. This will increase turnover of parking spaces.
- ◆ Implement a maximum time that vehicles can occupy loading zones. The allowed time can be based on the average time needed for the various kinds of loading and unloading activities.
- ◆ Step up enforcement of parking regulations, especially those that apply to vehicles that are blocking a traffic lane or that are illegally parked in a commercial vehicle zone.
- ◆ Eliminate multiple and confusing signs to clarify parking regulations.
- ◆ Publicize the DPW tow-away hotline, which accepts complaints about illegally parked vehicles and may to them away.

#### Long-term:

- ◆ Consider restricting parking of trucks larger than 2-axle, 6-tire vehicles to off-peak nighttime hours, perhaps 6 p.m. to 7 a.m., as with the restrictions in TR III zone traffic.
- ◆ Install parking meters for commercial vehicles in restricted spaces to encourage turnover.
- ◆ Increase fines for parking offenses.
- ◆ Consider the implementation of a fee system whereby couriers pay a premium to have parking spaces reserved solely for their vehicles during their peak delivery times.

### III.6 PERMIT SYSTEM

In order to provide parking for the many commercial vans in the area that provide services to office buildings such as elevator or heating system repair, the District could implement a permit system for commercial vehicles that occasionally need space all day for doing maintenance and other work in area buildings. These vehicles could be allowed to park or occupy loading-unloading spaces with the permit even if they are not actively loading or unloading goods. Building owners could be allowed a limited number of permits for such vehicles.

## IV. SECURITY

This section is intended to raise awareness of the potential truck-related security concerns facing the District of Columbia, and to present successful security practices from American and European cities.

Prior to recently being arrested as a charlatan and fraud, a self-styled security consultant issued a report criticizing the security posture of regional shopping centers in Chicago. A trade journal editorial cited the report and drew a reply from a shopping center security executive who dismissed the alarm by stating that the consultant had a “firm grasp of the obvious.” Fraud aside, creating a strategy to provide security in the District of Columbia against truck-borne threats *does* require a firm grasp of the obvious.

Consider the following:

- ◆ In May 2002, despite prior warnings of such an attack, a bomb attached under a diesel fuel tanker exploded within Israel’s largest fuel depot north of Tel Aviv.
- ◆ In July 2003, federal officials revealed that a truck driver had been arrested and suspected of conducting reconnaissance for Al Qaeda on the Brooklyn Bridge and other targets.
- ◆ In March 2003, a disgruntled tobacco farmer drove his tractor into the reflecting pool on the National Mall leading to a multi-day standoff with the authorities.
- ◆ Truck bombs—known as vehicle-borne improvised explosive devices (VBIEDs)—are being used continually for terrorist attacks throughout the world, with the most notable recent incidents occurring in Iraq and Turkey.
- ◆ In January 2001, a large truck rammed the California State Capitol and exploded, killing the driver.

What is obvious is that, in contrast to an individual facility, an entire urbanized area cannot be one-hundred-percent secured against the threat of a VBIED. The nature of the transportation system means that even in a nation as security-conscious as Israel a serious security breach involving a VBIED occurred. Governments will always balance enhancing security with enabling the free flow of goods vital to the local and national economies. The National Academy of Sciences, in its post-September 11th report, *Making the Nation Safer: The Role of Science and Technology in Countering Terrorism*, cites five characteristics of transportation systems that bear on any effort to increase transport security:

- ◆ Openness and accessibility
- ◆ Extent and ubiquity
- ◆ Emphasis on efficiency and competitiveness
- ◆ Diversity of owners operators, users, and overseers
- ◆ Entwinement in society and the global economy

Constraints on a comprehensive truck security strategy in the District of Columbia include the following:

- ◆ Truck transport is vital to the economy of the District, even though its economy is much less dependent on the movement of goods than other major metropolitan areas.
- ◆ Truck security in urban areas is generally oriented toward the protection of individual structures or campuses by the implementation of standoff zones and access control procedures. A comprehensive policy would identify an outer perimeter surrounding sensitive facilities within which special truck control measures are implemented routinely or during times of heightened threat.
- ◆ Truck security requires coordination among agencies concerned with highways and roads, public safety, and emergency management in the District and its two neighboring states. Within the District the Federal government fields 32 distinct law enforcement agencies.
- ◆ Security stakeholder organizations experience tension between sharing security information with, and withholding it from security partners. This is especially true for the many Federal agencies having security responsibilities within the District.
- ◆ Security technology and physical barriers notwithstanding, security is only as effective as the people and procedures surrounding the technology and enforcing the barriers. Training, simulations, and continual testing are expensive and necessary.

Countermeasures against terrorist acts include actions that forestall such an act before it begins through actions that mitigate terrorism's tragic and costly effects. The complete range of countermeasures to protect sensitive facilities and urban infrastructure against truck-borne threats addresses the following responses to the timeline of events before, during, and after a terrorist attack. Table 2 describes different countermeasures and their relevance to DDOT.

Table 2. Security Countermeasures and Their Relevance to DDOT

Countermeasure Category	Description	DDOT Truck Security Relevance
Preparedness (Design)	Measures such as personnel training, creation of policies and procedures, design of streetscapes, truck routes, truck inspection stations	Interact with other city, regional, and federal agencies
Prevention (Intelligence, Surveillance, and Interdiction)	Activities to prevent the launching of a terrorist attack	Use oversight of motor vehicle traffic to uncover pre-attack terrorist planning activities
Deterrence	Countermeasures which are visible to potential attackers and which deter an attack by raising the risk of apprehension or lowering the probability of success	Use oversight of commercial motor vehicle traffic to help deter potential attackers
Detection	Activities to detect an attack that is underway	Use oversight of commercial motor vehicle traffic to help detect attackers; use special

Countermeasure Category	Description	DDOT Truck Security Relevance
		purpose equipment to detect explosives and WMDs
Defense (Protection)	Activities to delay or prevent an attack in progress, and to protect and harden facilities against attack	Interact with agencies protecting facilities-at-risk, agencies planning for hardened streetscape features, and law enforcement agencies having truck-interdiction capability; direct truck traffic flow away from facilities-at-risk
Mitigation	Activities to reduce the deleterious effects of an actuated attack	N/A
Response	All actions by authorities in response to a terrorist act	Invoke existing emergency management plans
Recovery	All activities needed to return the affected area to normal after an event	Invoke existing recovery plans

This study gives the outlines of a truck security policy focused on large trucks (weighing over 10,000 pounds) and buses. The measures discussed in the balance of this section will emphasize deterrence and detection with some attention to prevention, and defense. There are two key issues in implementing a systematic solution to truck-borne threats focused on large trucks:

- ◆ The District government in general and DDOT in particular control only a small part of the system. The Federal government in its many parts exerts enormous power and depending on the agency, may or may not consult with the District regarding truck security.
- ◆ Clearly, the threat from VBIEDs is not confined to, or even projected to principally arise from, large trucks. However, these vehicles—especially hazardous materials tankers—are not only highly visible to the public, but offer the opportunity to leverage safety, credentialing, and operational technology being installed in large trucks for security purposes.

#### IV.1 THE TRUCK-BORNE THREAT IN THE DISTRICT OF COLUMBIA

The extent of the terrorist threat to the District is obvious. The threat is clearly not confined to trucks, but for all the reasons outlined in the introduction, security experts regard trucks as a highly likely means of delivering destruction in an attack. Potential targets could include:

- ◆ Federal agencies
- ◆ Federal monuments and landmarks
- ◆ Embassies
- ◆ Military facilities
- ◆ DC critical infrastructure
- ◆ Financial, religious, cultural, and patriotic icons
- ◆ Loci of gathered crowds

Terrorist scenarios involving large trucks and buses may involve a vehicle operated by either a trusted driver (where the terrorist device has been surreptitiously loaded onto or attached to the vehicle) or by a terrorist (where the vehicle has been obtained through legitimate or illegitimate means). The vehicle itself, such as a hazardous materials tanker, may be the means of destruction, or a VBIED may be present. In addition, the VBIED could be a means of dispersing chemical, radiological or biological agents.

In one sense the threat from large trucks in the District may be more manageable than in other large metropolitan areas. Because of its role as the nation's Capital, the District has proportionately fewer workers involved in industries that are related to the movement of goods than the United States as a whole. In addition, there are a reported 19 routes suitable for large trucks to enter or leave the city. Rock Creek, and the Potomac and Anacostia Rivers surround the core area of the city on three sides. The fourth side, however, is connected by numerous streets to towns in Maryland.

The overall threat from terrorism in the District is large and the probability of attackers' using large trucks cannot be discounted. To refine our discussion the nature of the threat, the following two sections discuss facilities in the District that are possible targets of an attack and the nature of hazardous materials transport in the District.

#### **IV.2. FACILITIES-AT-RISK**

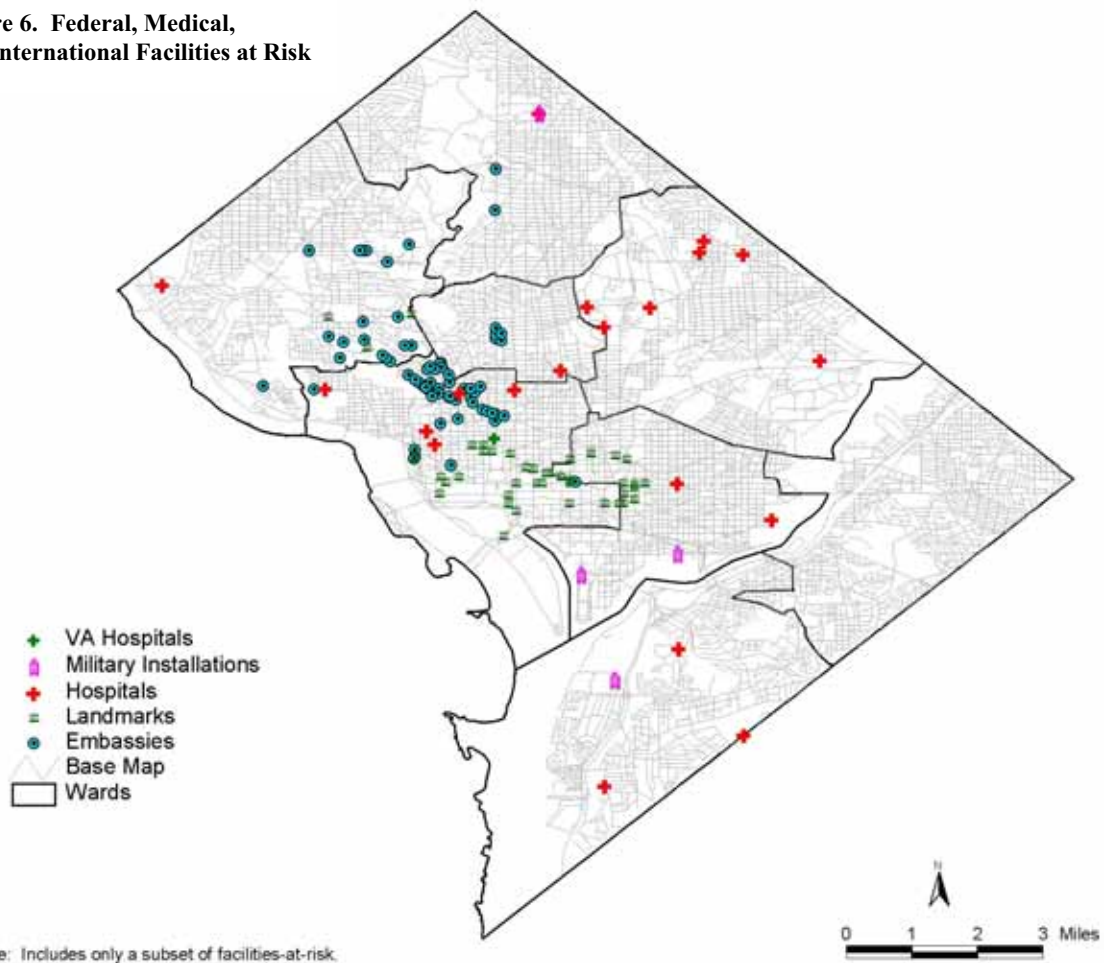
To identify the countermeasures that DDOT has available to increase the level of security against truck-borne threats in the District. Such areas include Federal agencies and monuments, embassies, and the security planning zones designated by the National Capital Planning Commission (NCPC). These sites are shown in Figure 6. These symbolic and substantive targets are concentrated in a core area around the National Mall.

The Federal agencies charged with protecting these facilities have instituted a variety of measures and policies aimed at reducing the threat from truck-borne explosives. These policies range from protective barriers and visual vehicle inspections to closed streets surrounding the facility and stringent controls to ensure the identity of truck, driver, and cargo before entry to the facility. The United States Secret Service has posted agents on streets in the vicinity of the White House to prevent truck traffic from entering the protected area. Policies for each facility may vary depending on the threat level issued by the DHS.

Figure 6 also shows the spine of embassies extending to the northwest along Massachusetts Avenue. Each embassy is responsible for its own security. However, the embassies are not.

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**Figure 6. Federal, Medical,  
and International Facilities at Risk**



removed from the fabric of the city and the District government is responsible for the safety of all of its residents. Although outside of the core concentration of Federal facilities, several embassies, notably Israel's, are high-risk potential targets.

The road network within the District intersects most critically with facilities-at-risk at the I-395-Third Street Tunnel, which passes under the Mall within 1000 feet of the United States Capitol. Although hazardous materials tankers are banned from the tunnel, violations do occur and other large trucks are permitted.

#### **IV.3. HAZARDOUS MATERIALS TRUCKING**

Because of the risk presented by hazardous materials transport, Volpe queried District agencies that monitor or otherwise have oversight over this traffic or its shippers. In general, federal, state and local government agencies do not monitor or regulate hazardous materials transport, except for:

- ◆ requirements for placards and packaging
- ◆ restrictions on transport through tunnels and over bridges
- ◆ transport of highly dangerous materials, such as fissionable nuclear materials.

Figure 7 is an initial effort to map potential sources of threat. These sources include terminal locations for hazardous materials. The most prevalent destinations for hazardous cargo in the District are gas stations. Although publicly available Internet information provided the locations of gas stations in Figure 7, the Department of Health Underground Storage Tank Division maintains up-to-date records on the location of underground tanks storing petroleum products used for energy production (except for residential storage of small quantities of home heating oil.) In any case, the relative sparseness of gas stations within the core of the District, as shown in Figure 7, suggests that fuel deliveries to those stations can be restricted and monitored.

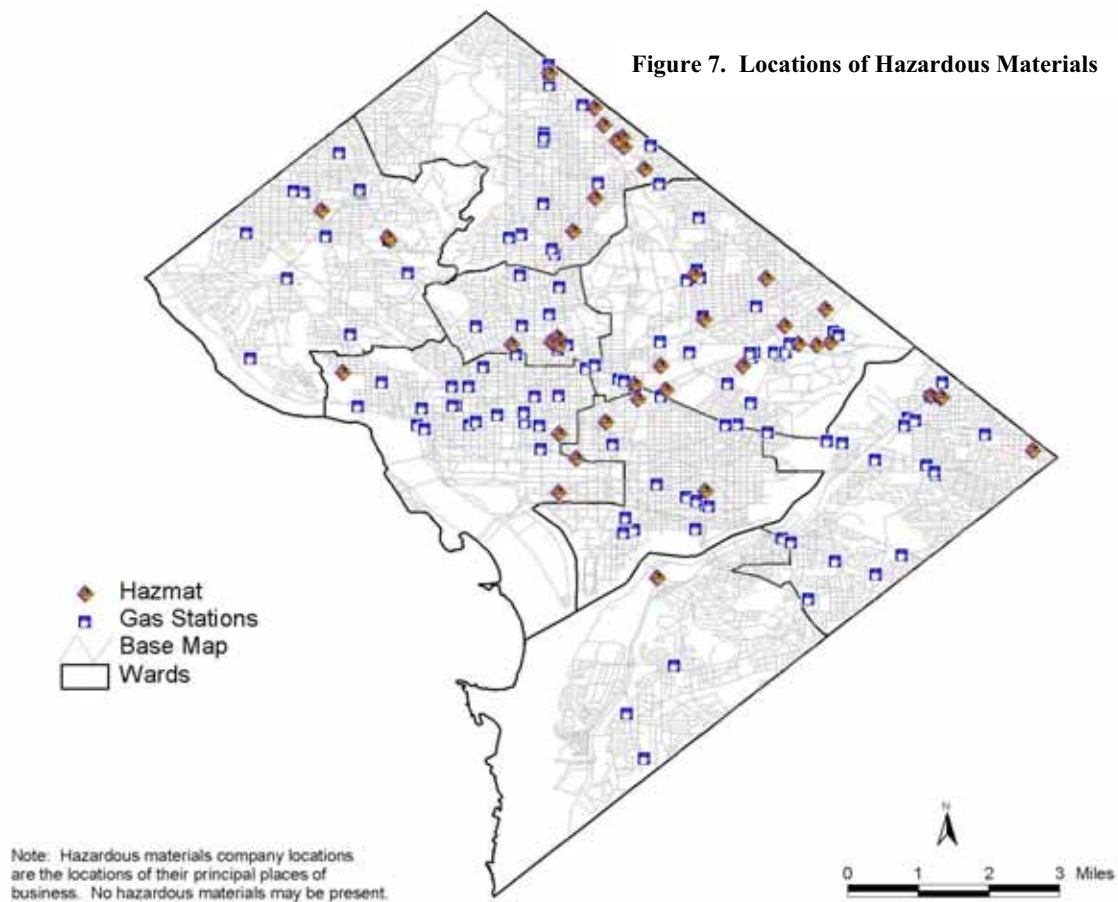
Although there are no major hazardous materials shippers in the District (other than the Federal government), the District is the principal place of business of hazardous materials motor carriers registered as such with the USDOT Research and Special Programs Administration (RSPA) and reported in Federal Motor Carrier Safety Administration (FMCSA) data. These locations are also mapped in Figure 7.

The District Department of Health, Environmental Health Administration monitors the storage and transport of hazardous waste and radiological materials, in addition to the locations of underground storage tanks. The Department of Consumer and Regulatory Affairs (DCRA) and the Fire and Emergency Medical Services Department monitor the shipment and usage of explosives in the District.

The Department of Health notes that there are no true transporters of hazardous waste in the District. Officials downplayed the volume of the materials they regulate and questioned whether a legitimate shipment diverted for terrorist purposes would be of sufficient size to cause mass casualties. These materials are often lead-tinged hazardous waste being disposed of by a major utility company, or radioactive materials used in medical procedures.

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Figure 7. Locations of Hazardous Materials



Hospitals are also the source and destination of radiological materials. The District Department of Health has determined that the quantities and types of radioactive materials involved are not likely to pose a major public health threat. Facilities shipping and storing fissionable materials must register with the U. S. Nuclear Regulatory Commission. All shipments of radioactive materials are closely regulated and monitored. More dangerous fissionable materials are not usually shipped by truck.

The District's DCRA and the Fire and Emergency Medical Services Department issue permits for shipments of explosives and for their detonation. The Metropolitan Police Department (MPD) escorts high-risk explosives shipments. The overwhelming majority of these shipments are related to construction activity, fireworks displays, and movie productions. The number of explosives shipments (and detonations) is low and tends to be correlated with construction activity.

Continuing analysis of the geo-locational relationships of sensitive facilities and the likely routes of truck-borne threats, including the location of terminals for hazardous materials, will be necessary to reconcile truck security countermeasures with the changing cityscape. The ability of the analysis (and the countermeasures) to accommodate change rapidly is advisable even in an urban area that is as institutionally stable as the District.

#### **IV.4. DISTRICT OF COLUMBIA TRUCK SECURITY STAKEHOLDERS**

Creating a series of policies, countermeasures, and responses oriented toward increased security against truck-borne threats requires the participation and leadership of agencies concerned with:

- ◆ truck traffic management and truck safety
- ◆ hazardous materials storage and transport monitoring
- ◆ security and law enforcement.

At the same time that policy areas are spanned to address truck security, policies, countermeasures and responses should bridge jurisdictional boundaries in the DC metropolitan area as well. The elements for a terrorist attack will be assembled from resources imported into the District. If these elements can be interdicted before entering the District, the chances of preventing an attack will be increased.

The number of stakeholders involved in truck security is large and diffuse ranging from Federal security agencies to relatively small units of the District of Columbia Department of Health. In addition, the impact of any policies implemented will fall on the private sector. Therefore, Volpe has sought input from private sector organizations, District agencies outside of DDOT, neighboring state agencies, the federal agency concerned with truck and bus safety, and federal law enforcement and security agencies. Many of these agencies were contacted as part of the larger comprehensive truck management agenda, but security concerns were discussed in many of the "best practices" interviews.

The overall picture that emerges is one of divided responsibilities, even among Federal agencies. The tasks before all of these agencies are large and their resources are limited. With the creation of the U.S. Department of Homeland Security, the organizational home of key Federal security

agencies has changed. Because of the concerns of security, many agencies were not willing to divulge the details of their strategies; however, the general outlines of their concerns will be summarized without revealing the particular agency respondents.

#### **IV.4.1. Private Sector**

Trucking, bus, and package delivery companies and their respective trade organizations are aware of the potential for terrorist misuse of their vehicles. This is especially true for hazardous materials carriers. Motor carrier trade organizations and trade journals are disseminating voluntary policies that responsible industry managers may follow to reduce the likelihood of an incident, and indeed, to reduce the incidence of everyday criminal activity such as hijackings. In addition, hazardous materials carriers are cooperating with the Federal Motor Carrier Safety Administration in a series of demonstrations of technological applications that enhance the safety and security of these sensitive shipments.

Package delivery companies are affected by the heightened awareness of security by their customers and they are, of course, concerned with safeguarding their drivers. While their delivery trucks are usually smaller than the large trucks under consideration in this document, their omnipresence and access to all parts of the city mean that policies concerning these operations should not be ignored. There is a significant threat posed by the potential for the timely delivery of coordinated shipments of improvised explosive devices. In addition, the cargo that the delivery trucks carry is delivered to staging hubs using heavy trucks. These companies have implemented national package screening programs and have cooperated with customers who request that drivers serving highly secure facilities undergo F.B.I. background checks. All delivery trucks are subject to the search and inspection procedures required by secure facilities, such as the White House or the Department of State, with the time for the inspection added to the guaranteed delivery time.

#### **IV.4.2. Government Agencies**

There are a number of District agencies that have incidental or tangential concerns with truck security. These agencies collect data that will be of use in planning countermeasures and responses to truck-borne terrorist attacks. In addition, these agencies implement procedures that may be integrated with security-related measures that DDOT might consider.

For example, the agencies within the District that have some portion of the responsibility for monitoring hazardous materials provide a resource for locating the source and destination of hazardous materials from their records. As noted above, the agencies with oversight for various aspects of hazardous materials are:

- ◆ Department of Consumer and Regulatory Affairs
  - Department of Health, Environmental Health Administration, Bureau of Hazardous Materials and Toxic Substances
  - Underground Storage Tank Division
  - Hazardous Waste Division
- ◆ Department of Health, Environmental Health Administration, Bureau of Food, Drug and Radiation Protection, Radiation Protection Division

- ◆ Fire and Emergency Medical Services Department
- ◆ Metropolitan Police Department

The Emergency Management Agency is the lead agency for coordinating the District's response to all types of emergencies. In addition, the agency has the mandate to reduce the hazards, including terrorist threats, which the District faces. Although the agency has focused on creating emergency response plans defining the activities and responsibilities of District government departments during an emergency, as a key agency that performs liaison duties with the U. S. Department of Homeland Security, the Emergency Management Agency must be included in the planning for deterrence and prevention, as well as for response.

The Metropolitan Police Department is the agency that “owns” the District government's security concerns with its Domestic Security Office as the focal point. In addition, the Department's Special Services Unit Motor Carrier Unit is responsible for motor carrier safety and works with the FMCSA to perform safety inspections on commercial vehicles. The Department is the only District government agency outside of DDOT that receives U.S. Department of Transportation funds. As previously described, the Department also monitors and escorts dangerous cargoes. The MPD already encompasses both trucking regulation and security in its organization.

During the period of heightened alert following September 11, 2001 the Department increased the volume of its random stops of commercial vehicles. To be able to use the information on trucking patterns accumulated from these stops, the MPD created a motor carrier database for the information collected in these stops. The database contains over 27,000 records and has been shared with neighboring jurisdictions in order to determine if there have been any patterns of suspicious activities. Additional resources for the Motor Carrier Unit would enhance the ability of the District to notice anomalous truck operations that might indicate terrorist activity.

The MPD has built a Joint Operations Command Center, which is used during emergencies to coordinate and exchange information between the MPD and agents of the Federal Bureau of Investigation and the U.S. Secret Service. Video images from MPD cameras, as well as DDOT traffic cameras are displayed in the command center.

#### **IV.4.3. Stakeholder Concerns**

In summary, stakeholder concerns include the following:

- ◆ District Government
  - Determining the priority of technology-based truck security given limited resources.
  - Developing prevention and preparedness policies that are matched to the DHS reported level of threat when there are only two levels short of an actual attack in progress that are in practical use.
- ◆ Motor Carrier Enforcement
  - Additional training in the interaction between motor carrier safety enforcement and security concerns.

- Additional motor carrier enforcement resources are needed to implement security measures.
- Difficulty in recruiting and retaining police with expertise in motor carrier issues.
- ◆ Private Industry
  - Security-related closures add time and expense to deliveries.
  - Security plans seem to be devised without input from local business community.
  - Industry would like to understand how they would be notified of evacuation routes in the case of a major attack or other disaster, so that they can inform their drivers.
- ◆ Federal Government
  - Coordination and cooperation with the District concerning street closures around federal facilities.

#### IV.5. REGIONAL INITIATIVES

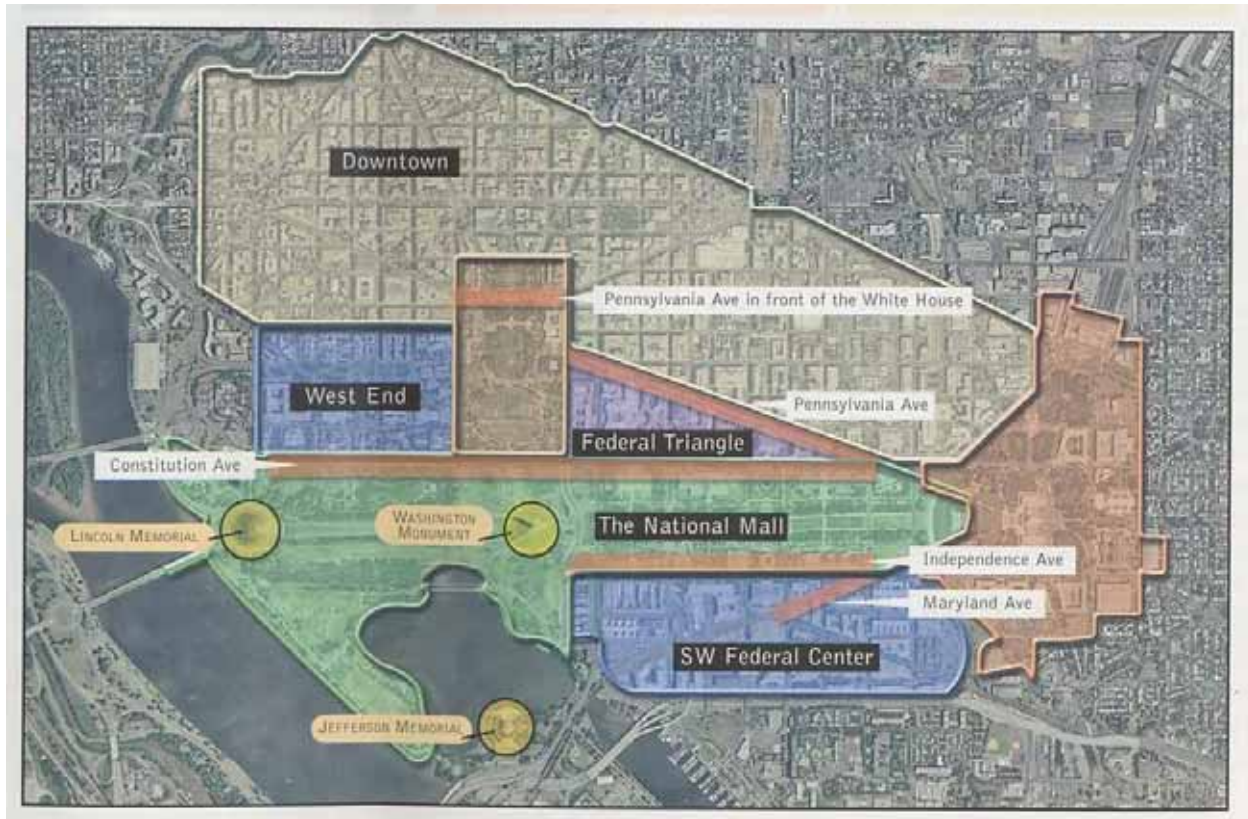
Regional planning agencies are at the forefront of preparing analyses and beginning to implement policies to improve the security posture of the Capital region. Relevant agencies include:

- ◆ National Capital Planning Commission (NCPC)
- ◆ Metropolitan Washington Council of Governments (MWCOC)
- ◆ Capital Wireless Integrated Network (CapWIN)

The National Capital Planning Commission has prepared a plan that outlines the elements of security-aware streetscape design that does not detract from the esthetic essentials of Washington's institutional and monumental character. The Commission is proposing the design and placement of security barriers, such as hardened lampposts, benches, and tree enclosures to form barriers between facilities-at-risk and vehicle threats. The plan delineates design zones that have been reproduced here in Figure 8. The overall zone defined by the NCPC is roughly equivalent to the "truck control zone" defined in the Section VI of this report. This zone encompasses most of targets that are most attractive to terrorists.

The Truck Safety Task Force of the Metropolitan Washington Council of Governments published a truck safety technology analysis in October 2003. The report recommends the installation of several technologies, some of which are directly relevant to security concerns. These technologies will be discussed in later in this section.

Led by the state of Maryland, the CapWIN project provides integrated wireless communications links among public safety agency personnel responding to emergencies. CapWIN integrates data and messaging systems among multi-state, inter-jurisdictional transportation and public safety agencies. CapWIN, according to its web site [www.capwin.org](http://www.capwin.org) "provides a 'communication bridge' allowing mobile access to multiple criminal justice, transportation, and hazardous material data sources."

**Figure 8: National Capital Planning Commission Contextual Zones**

Source: *The National Capital Urban Design and Security Plan*, NCPC, October 2002.

#### **IV.5.1. Neighboring States**

The neighboring states of Maryland and Virginia were contacted to determine their initiatives with respect to truck security, any regional coordination activities in which they participated and their policies regarding hazardous materials transport. Volpe interviewed state police and environmental agencies in each state.

The Maryland State Police reported that they instituted special measures for trucking enforcement in the period immediately following September 11. Personnel were diverted to the Washington and Baltimore areas. In the metropolitan areas, scale houses were opened 24 hours per day and roadside inspections were staggered, so that truckers would not be able to discern a time pattern for enforcement. Additionally, the Maryland State Police changed the proportions of the types of inspections. By reducing the number of Level 1 inspections, which require an inspector to go under the truck, the Maryland State Police were able to increase the number of trucks scrutinized. These measures will be implemented at any time the threat level is raised to orange.

The Virginia State Police likewise posted extra patrols in their critical metropolitan areas: Washington, DC and Hampton Roads. Their units were particularly attentive to hazardous materials shipments. When asked about coordinating efforts, aside from the Washington, DC

regional activities reported above, the Virginia respondent mentioned a multi-state committee of motor vehicle enforcement and motor vehicle departments (DMVs) including Maryland, Virginia, North Carolina and West Virginia. The District does not participate in this committee.

The Maryland Department of the Environment and the Virginia Department of Environmental Quality were asked about their stance with respect to hazardous materials transport. Both states, as required by law, implement federal regulations with respect to hazardous materials transport in their states. Virginia has no state-specific regulation. Maryland does restrict hazardous materials traffic in the state and thus requires some additional monitoring beyond that required by the federal government.

#### **IV.5.2. Federal Law Enforcement Agencies**

The federal government is the major player on security issues in the District, with some agencies having wide authority to affect policy decisions normally reserved to local authorities, such as street closures around sensitive facilities. A major characteristic of federal security-related policies within the District is that there is not just one agency with responsibilities for protecting federal facilities in Washington. The District of Columbia must forge coordinating security policies with 32 independent federal law enforcement agencies. Among the most significant are:

- ◆ United States Capitol Police
- ◆ United States Department of Homeland Security
  - Federal Protective Service
  - Office of National Capital Region Coordination
  - Transportation Security Administration
  - United States Secret Service
- ◆ United States Department of the Interior, National Park Service, and National Park Service Police
- ◆ United States Department of State, Bureau of Diplomatic Security, Domestic Facilities Protection

Each of these agencies formulates security policies for the facilities it protects. The key to facility protection is the standoff zone within which only inspected, trusted vehicles are allowed. For the highest profile locations state-of-the-art technology and techniques, such as the Itemizer™ detector for trace explosives, and stout physical barriers (some retractable) are used to establish a perimeter, demarcate a standoff zone, check trucks and cargo, and verify the identity of drivers. At the same time, the architectural design of many sensitive federal office buildings in the District does not permit separation of these facilities from the streetscape. Security officials at one facility recognized that closing off all streets surrounding the facility was infeasible given the needs of District traffic circulation, although from a facility protection standpoint such a shutdown is desirable. Even without street closure, parking adjacent to sensitive facilities is likely to be banned. Federal officials cited official coordination and working relationships with the MPD, the Public Works Department, and DDOT.

The U.S. Capitol Police has instituted the most far-reaching policies for truck security. These include a remote cargo transfer facility where loads are placed in trusted vehicles operated by trusted drivers and a robustly protected perimeter defining its standoff zone.

Under a priority voiced by Chief Ramsey, the District Council has passed a resolution allowing the MPD to enter into cooperative agreements with Federal law enforcement agencies. These agreements allow federal law enforcement personnel to enforce District law on District streets and sidewalks surrounding federal buildings and land. Each agreement is tailored to the needs of the signatory agencies. These agreements have the potential of forming the basis of more coordinated policies between the District and the Federal government for the purposes of security against truck-borne threats.

#### **IV.5.3. Federal Motor Carrier Safety Administration**

The United States Department of Transportation, Federal Motor Carrier Safety Administration, is charged with ensuring truck safety. The agency has funded an effort to explore the application of Intelligent Transportation Systems (ITS) technology to trucking safety and operations in the District. The portion of ITS concerned with trucks is named Commercial Vehicle Operations (CVO). The FMCSA recognizes the potential for ITS CVO to serve security purposes concomitantly with its primary safety mission.

#### **IV.6 COMMERCIAL VEHICLE SECURITY PRACTICES OUTSIDE OF THE DISTRICT**

Many valuable lessons can be learned in the area of truck security by the procedures used by the Department of Homeland Security (DHS) at our land border ports of entry. The Bureau of Customs and Border Protection (BCBP) uses various methods to try to ensure that dangerous conveyances are not allowed to enter the United States. BCBP combines intelligence to try to target high-risk vehicles as well as random checks to ensure that low risk categories of vehicles remain low risk. They also use technologies such as Vehicle and Cargo Inspection System (VACIS) x-ray equipment and dogs to try to detect contraband.

For decades, the US Customs Service was tasked with ensuring that illegal contraband was not permitted to enter the United States. Their approach to this problem was simple: Limit the number of entry points into the US, then target the highest risk vehicles for inspection. This approach worked well for narcotics and other illegal substances, where it was sufficient that a certain percentage was interdicted. However, when the threat of weapons of mass destruction (WMD) emerged, it was no longer acceptable that any of these weapons pass through without detection. Additional technologies have been employed to help with this effort, and more resources have been applied toward improving the intelligence that will lead to suspect shipments. Now that the Customs Service has moved to DHS, interdicting WMD is this agency's primary focus.

Of course, the land borders of the United States are a very different environment from major metropolitan areas such as Washington, DC. For instance, land borders have a limited number of well-identified entry points. Vehicles wishing to enter the U.S. must cross the border at one of these points and then be inspected by a DHS officer. However, there are many different roads

leading into Washington, DC. In order to establish an effective perimeter around part or all of Washington, it would be necessary to prohibit commercial vehicles from using most secondary roads and then apply the resources necessary to enforce these restrictions. While there is technology that can support such an effort, it would probably be necessary to close some roads to all traffic in order to make this scenario viable. The efforts undertaken by the U.S. Capitol Police to limit vehicular traffic on Capitol Hill to only authorized and inspected vehicles illustrates the difficulty in implementing a secure perimeter. Should other areas of Washington, DC be identified as being at high risk to a truck bomb attack, similar procedures would need to be put in place to secure them.

Assuming a secure perimeter can be established around parts or all of Washington, DC, techniques used by BCBP could then be applied. Commercial vehicles would need to be screened at selected entry points and a process for inspection would be established. Depending on the level of threat, a certain percentage of vehicle inspections would be conducted at particular degree of thoroughness. Factors such as weight, motor carrier, and manifest anomalies would be considered in targeting which vehicles would be inspected.

BCBP uses other techniques to ensure that the screening process is effective. Periodically, they will perform what is known as a “block blitz”, which involves performing a thorough inspection of all vehicles in the queue at a random point in time. This provides protection against smugglers who, while monitoring the inspection process, may have identified an inspector who is not being as thorough as the others. Smugglers often target certain inspectors when they feel they have the best chance of evading detection and will purposely wait in this line. For this same reason, inspectors are often rotated to different locations throughout the day.

At the land border, there is a constant need to balance security with throughput. The only way the area inside the perimeter could be one hundred percent secure would be to prohibit all traffic from entering. Since this is not possible in large areas, a certain degree of risk will need to be accepted. Efforts to lower this risk through more thorough and complete inspections will result in more delays for those in transit.

There are other techniques that have been utilized by BCBP to make the inspection process more efficient. For example, a program of trusted carriers could be established, whereby trucking companies take it upon themselves to ensure the security of their cargo in order to bypass the perimeter inspection process in most cases. The Customs Service had a pilot program as part of the North American Free Trade Agreement (NAFTA) that tried to do this, and the Customs-Trade Partnership Against Terrorism (C-TPAT) uses a similar model for cargo container shipments. Since the carriers have a vested interest in being able to pass through inspection quickly and to have their facilities and vehicles secured, they are usually willing to adhere to a series of security requirements that are ultimately aimed at ensuring the safe transportation of freight from end to end.

#### **IV.6.1. Security Practices in Other Cities**

All major cities face terrorist threats. The 1995 bombing in Oklahoma City shows that attacks are not limited to large cities. Examples of truck security measures in U.S. and foreign cities illustrate the extent to which security concerns are weighed in conjunction with traffic

management issues. The overall truck management “best practices” interviews produced some information on truck security strategies.

### ***London, England***

The premier example is the central core of London, England. After a series of Irish Republican Army (IRA) terrorist attacks in 1992 and 1993, the City of London installed a security cordon consisting of surveillance cameras and heightened police patrols. This cordon came to be known as the Ring of Steel, where the license plates of all vehicles entering the ring were vetted against a watch list of plates related to known or suspected terrorists. Early this year London instituted a congestion pricing strategy where all cars within the central core are charged a fee. Compliance with the charges is enforced by cameras similar to those used in airports or ports, which interface with software that automatically identifies and records the license plates of all vehicles in the core with a 90% rate of accuracy. Even with the wide acceptance by the public of the use of surveillance cameras in Great Britain for crime prevention, a controversy has arisen over the use of the congestion pricing cameras for general anti-crime, anti-terrorist surveillance purposes.

### ***Baltimore, Maryland***

The Port of Baltimore sponsors an interagency task force, which has created security measures. When the city is on the highest level of security alert, the state of Maryland requires truck inspections at the major southwest gateway into the city along I-95. At such times, truck traffic is not allowed to leave the highway to enter the city after inspection.

### ***New York, New York***

In the aftermath of September 11, all traffic into lower Manhattan was restricted. Once these restrictions were loosened, truck traffic was subject to inspection before entering Manhattan. The metropolitan planning agency (MPO) noted that each transportation and law enforcement agency in the tri-state area had its own plans and policies for security. The MPO in a post-September 11 safety and security report determined that the major vulnerabilities involved the region’s bridges and tunnels. The individual jurisdictions are sensitive to having the MPO take a lead role in coordinating security strategies in the region.

### ***San Francisco, CA***

The Department of Homeland Security identified the Golden Gate Bridge as one of America’s most vulnerable landmarks. It also serves as a critical element of transportation infrastructure for the Bay Area, connecting San Francisco with Marin County. Despite the fact that the bridge is considered to be a potential target for terrorism, no formal process of inspecting or screening cars or trucks has been instituted. Additional police officers have been hired to provide a show of force, and the Coast Guard monitors vessel activity beneath it, but it is acknowledged that the costs and traffic impacts associated with attempting to prevent a truck-borne weapon from being driven onto the bridge are simply too great.

#### IV.7. TRUCK MANAGEMENT TECHNOLOGY AND SECURITY

The many technologies available to increase trucking safety, increase trucking operational efficiency, enhance highway traffic operations, and increase highway safety are being tested, deployed, and improved constantly. With increases in processing speed and decreases in the cost of data storage, technological functionality (e.g., cell phone features) that was not possible five years ago is now nearly universally available. Devices that may be used to increase security against truck-borne threats are now under development, and will be available within a relatively short time frame. The events of September 11th accelerated efforts to leverage these technologies for improved security of the transportation infrastructure and against vehicle-borne threats.

The broad classes of technology that are applicable to truck management and security include:

- ◆ Sensors, such as explosives detection
- ◆ Wireless communications
- ◆ Video surveillance and imaging
- ◆ Data mining and advanced data processing
- ◆ Geographic information systems and geo-locational analysis
- ◆ Global positioning systems
- ◆ Electronic driver, vehicle, and cargo identification

The FMCSA is conducting a Hazardous Materials Safety and Security Field Operational Test to measure the effectiveness of Intelligent Transportation Systems (ITS) safety and security technologies for safeguarding hazardous materials being transported by trucks. The test will include 100 trucks equipped with a variety of existing technologies. The technologies will be packaged in several different cost tiers, and will be tested across four different transportation scenarios. The project will test the capabilities of technologies such as:

- ◆ Driver verification using password logins, fingerprint biometrics and smart cards
- ◆ Vehicle and load tracking using satellites and other wireless systems
- ◆ Off-route and stolen vehicle alerts using geo-fencing
- ◆ Cargo tampering alerts using electronic seals
- ◆ Driver distress alerts using driver panic buttons
- ◆ Remote vehicle-disabling in instances of known terrorist attacks

As federal agencies institute demonstration programs among motor carriers and jurisdictions, the District should investigate participating in these programs as a way to receive additional funds to test the application of advanced technologies. For example, the District could require all hazardous materials carriers operating in the District to have implemented some of the technologies listed above.

The Truck Safety Task Force of MWCOC recommendations on the technology to be applied in the Capital Region included the following that have a direct application to security:

- ◆ Geo-fencing
- ◆ Panic and/or vehicle disabling systems
- ◆ Virtual weigh stations
- ◆ Infrared cameras
- ◆ X-Ray devices
- ◆ Commercial vehicle radiological systems
- ◆ Transportation worker's identification card (biometric identification)

An integrated technological strategy for truck security is based on wireless communications technologies and digital data processing. When implementing these systems, intense attention must be paid to issues of cybersecurity, lest digital or communications tampering render the system ineffective.

#### IV.8 CHALLENGES TO IMPLEMENTING A TRUCK SECURITY STRATEGY

The policies, countermeasures, and responses needed to address truck-borne threats touch upon the responsibilities of multiple agencies in multiple jurisdictions. The effectiveness of these measures will have a direct bearing on the safety of the District's residents and labor force, including the highest officials of the nation. There are several challenges to implementing a comprehensive truck security strategy that addresses the entirety of the District's urban space.

- ◆ *Who is in charge of implementing a truck security strategy for the District?*  
More specifically, is DDOT the appropriate agency? Security is a function of police agencies. However, with respect to transportation, public safety officials, including the police, focus on the resources that are required for emergency preparedness and response—evacuation routes, maintenance of infrastructure functionality in case of widespread power failure, and deployment of resources in the event of an attack. The MPD is underfunded for their present responsibilities, even without asking the department for increased attention to truck-based terrorism. Given that the MPD has other priorities, DDOT can provide the leadership in bringing the relevant agencies together to forge a truck security strategy that is integrated with overall truck monitoring and controls. However, as the programs are developed, the MPD will be the lead agency for implementing these efforts and for working with federal law enforcement agencies.
- ◆ *What is the relationship of federal law enforcement agencies to the District with respect to a truck security strategy?*  
Federal law enforcement agencies, most notably the United States Secret Service, have the authority to close streets and restrict traffic (and have exercised it) without prior consultation with the District government. Overarching security concerns will necessarily limit the extent that the Federal agencies communicate their plans for the most serious emergencies. However, from the standpoint of planning for preparedness, prevention, deterrence and detection during what has come to be the “normal” state of alert, these agencies can coordinate with the District government to ensure that commerce within the District remains viable and to enable District government resources to be a first line of defense outside of the core area containing key federal facilities. Different Federal law enforcement agencies have

practiced varying levels of coordination with the District concerning the effects of their security policies on traffic.

The MPD Joint Operations Command Center is a model for cooperation between federal and District law enforcement agencies. Implementation of a comprehensive truck security strategy will require a similar level of coordination.

- ◆ *What is the role of technology in truck security and do its benefits justify the resources necessary for implementation, operation, and maintenance?*

The continued incorporation and increasing ubiquity of what is broadly called technology in all areas of economic activity is an expected feature of modern life. Competitive pressures, cheaper devices, and federal regulatory incentives are leading trucking companies to increasingly install technology to improve their operational efficiency in serving their customers and in interacting with government agencies. Some of these technologies can be leveraged to serve the purposes of truck security, especially as they become more widespread.

#### **IV.9 THE AVAILABLE RANGE OF STRATEGIES**

The strategies available to DDOT fall in the following general areas:

- ◆ Integrate truck security measures with truck tracking and control mechanisms for other purposes, especially ITS/CVO.
- ◆ Pursue aggressively all opportunities to coordinate security measures with other District, federal, regional, and neighboring state agencies.
- ◆ Become the lead agency for demonstrations and tests of advanced technology related to truck security in the District.
- ◆ Institute truck screening and inspection, especially for hazardous materials shipments.
- ◆ Implement a systemic, layered series of countermeasures.

##### **IV.9.1. Integrate Security with ITS/CVO**

Areas for integration include truck controls, crime prevention measures, and ITS. Any new projects or implementation enhancements should be evaluated against security requirements. A small increment of resources may enable the truck control, crime prevention, or ITS installation to serve the needs of security. The use of ITS is rapidly spreading. While the experience of the British shows that the redirection of ITS resources for security purposes is likely to be controversial, ITS planners are rapidly increasing the capabilities of ITS installations to be useful for security purposes.

The District has already installed CCTV for the prevention of crime and terrorist acts. Extensions of this system may be useful in identifying commercial motor vehicles, particularly those that are being operated in a suspicious way. Research is continuing in linking video surveillance with facial recognition software, but recent tests have been unsuccessful.

### A Sample of Applicable Technologies

◆ *Automated Vehicle Location (AVL) and Geo-Fencing*

Geo-fencing refers to the use of automated vehicle location (AVL) technology based on global positioning systems (GPS). Signals reporting the location of the vehicle are received at a base operations center. The center has software that compares the location of the vehicle against demarcated areas. If the vehicle crosses into a prohibited area, an alarm may be generated at the base or another location. The efficacy of GPS can be reduced if line of sight communications cannot be maintained with three of the satellites that determine location. However, GPS can be combined with cellular or other wireless technology to provide geo-locational information in urban canyons or other problematic locations. Geo-fencing technology is useful for identifying trusted vehicles and tracking sensitive cargoes; however, the technology is likely to be absent from or disabled on a vehicle seeking to evade controls.

◆ *Mobile and Relocatable Systems for Cargo Imaging or Explosives Detection*

Several manufacturers use diverse technologies to detect the presence of contraband in truck trailers and other vehicles by creating images of the vehicle's contents. These technologies no longer need to be installed in fixed locations, but can be installed in a vehicle that can operate from changing locations or while in motion. One such system is Mobile VACIS™, which uses gamma rays to examine the vehicle contents. The system does not require the use of specialized protective enclosures and can scan a moving vehicle in 10 seconds. Another system is the Mobile Vehicle Explosive Detection System (VEDS) which can automatically detect explosives in stopped vehicles. In the urban environment such equipment represents a relatively unobtrusive means of detecting threats. The Metropolitan Police Department and Federal law enforcement agencies are seeking to acquire or have acquired such equipment for operational tests.

◆ *Video Surveillance, including infrared detection*

Video surveillance, including infrared detection and imaging, is a means of identifying and tracking vehicles. No additional equipment needs to be installed on-board the vehicle. Video surveillance is no longer dependent on humans to monitor video images for anomalous or suspicious activity, but is increasingly linked to software that provides automated intelligence to monitor the images. The simplest applications are widely deployed license plate readers that can automatically check registration numbers against a watch list. Other systems include facial recognition, motion detection, and detection of more complex anomalous events. Not all of these products are ready for mass deployment in an urban area, but many systems are available for testing and demonstration purposes. Automated software video monitoring would provide the ability to track vehicles that are attempting to evade official countermeasures on marked truck and hazardous cargo routes.

■ *ITS-CVO Automatic Vehicle Identification (AVI)*

Automatic vehicle identification (AVI) combined with a wireless communications mechanism like dedicated short-range communications (DSRC) can also be used to track and identify trusted vehicles in an urban area. As larger numbers of trucking companies equip their trucks with this technology for interacting with the FMCSA, District officials would be able to identify most large trucks crossing the District line using the major truck routes.

#### **IV.9.2. Coordinate with Intra- and Extra-Jurisdictional Agencies**

The need for coordination has been discussed throughout this discussion of truck security. The multiplicity of agencies in diverse policy areas and in disparate jurisdictions may lead to a lack of focused response to the security threat posed by trucks in the District. District officials noted that an effective response to issues of truck-borne threats would need to start at the Capital Beltway in the neighboring states of Maryland and Virginia.

#### **IV.9.3. Lead Technology Demonstrations**

As the nation's Capital, the District is in a unique position to be on the cutting edge of using technology and stringent truck control policies to implement a security strategy. In addition to the FMCSA program, the Department of Homeland Security is beginning to implement port security demonstrations. Although not a port, the District might seek to design a demonstration project that shows how similar technologies can be used in the urban setting. The District can work with Federal agencies to become a test bed for policy and technological applications for security.

#### **IV.9.4. Screen Trucks, Especially Hazardous Materials Haulers**

If a decision were made to restrict commercial vehicle traffic from a large area of Washington, DC, a “trusted carrier” concept could be established for those wishing to provide transportation inside a secure perimeter. Carriers would need to screen their own cargo and maintain a secure storage/transfer facility outside the perimeter.

There are basically two ways to implement a secure perimeter. One is similar to the manner in which the U.S. Capitol Police has done. It involves establishing a pre-screening area for all non-trusted commercial vehicles and monitoring them in a variety of ways as they move from the screening facility to the perimeter. The other involves only allowing trusted or government-owned vehicles inside the perimeter, and off-loading all deliverable material from other carriers at an external transfer facility. Obviously both of these alternatives have significant negative impacts in terms of cost and on the economic vitality of the businesses inside the secure perimeter. Just-in-time delivery of production materials, perishable goods, and general inventory has become a requirement for businesses wishing to remain on a level playing field in a competitive environment. The likelihood of a terrorist attack using a truck-borne weapon would have to be extremely high in order to warrant establishing a large secure perimeter.

What makes more sense in the current threat environment is to consider smaller, more manageable perimeters such as those established around the White House and U.S. Capitol. Locations that also rank high on the list of potential terrorist targets might need to be similarly isolated, especially if the threat level were to increase. Precisely how these perimeters should be set up and operated needs to be outlined in a security plan that considers the areas of responsibility for the Federal and District governments, various safety and law enforcement officials, and employees of the businesses and agencies inside the perimeter.

DDOT should develop a truck security plan that describes actions that are to be taken during periods of high terrorist threat. This plan should identify key areas that need to be protected, and

the actions needed to establish a secure perimeter. The Department of Homeland Security can provide a prioritized list of facilities and structures as guidance, but in general, these would be places that are icons of the Federal government, key pieces of transportation infrastructure, and locations where large numbers of civilians may be located. The security plan should focus on ways to make these areas more difficult to attack, and concepts for efficiently maintaining this security posture long term, should a high threat of terrorism become more protracted.

Routes approved for the conveyance of hazardous materials (hazmat) should be reconsidered given their potential for use as terrorist weapons. These routes should ensure safe standoff from areas that are high on the prioritized list of critical assets, and signs should be erected so that the routes are clearly marked.

#### **IV.9.5. Evaluate and Implement Countermeasures by Timeline Category**

Broadly speaking, if all countermeasures were implemented, trusted trucks and buses operated by trusted drivers carrying verified cargo would be (1) continuously inspected for surreptitious improvised explosive devices and (2) only travel at times and along routes known to the authorities. Alternate routes would be equipped with surveillance cameras to monitor the streets for unauthorized trucks and buses. In addition, all such vehicles would be equipped with foolproof remote engine kill switches with other means available to law enforcement agencies available to stop a suspicious vehicle.

Clearly, short of a hot war on our shores, no municipality—not even Washington, D. C.—is likely to implement the full range of countermeasures for all trucks and buses. However, it is necessary to evaluate the efficacy of implementing subsets of these measures depending on the type of commercial vehicle and the level of threat declared by the Department of Homeland Security.

To **improve preparedness**, agencies can use geospatial data to determine and refine truck security policy by analyzing existing truck routes, existing truck volume (by size and type of truck), hazardous materials terminals, facilities-at-risk, and facility standoff zones.

For **preventing terrorist activities**, commercial vehicle drivers and the public should be educated to recognize suspicious activity. One example of such a program is the American Trucking Associations (ATA) Highway Watch program, which is a state-by-state effort where truck drivers report incidents of all types to a single-purpose telephone line. Drivers are trained to recognize the kinds of suspicious activity that might indicate a security threat. Additionally, the ATA runs the Trucking Information and Analysis Center to be an interface with the Federal government, principally the DHS National Infrastructure Protection Center.

Further, hazardous materials and other **commercial motor vehicle drivers should be trained to inspect vehicles for explosive devices**. The American Trucking Associations and bus trade groups have instituted voluntary programs to raise driver awareness of the need to thoroughly inspect their vehicles and safeguard their loads. Although beyond the scope of an urban area with a lower level of goods production and movement than most urban areas, technologies exist to assist the driver in safeguarding his or her load. This countermeasure is related to the FMCSA

demonstration program. Once the technology is shown to be feasible and cost-effective, the District should consider entering into a demonstration where all trucks bearing hazardous materials would be required to have some of the technologies being tested. The District could also consider requiring tour bus and long distance bus operators in the District to adhere to a minimal set of standards for training drivers and implementing anti-terrorism policies, such as bag matching for intercity trips.

For **deterrence and detection**, perimeter(s) within which truck traffic is restricted and/or monitored can be established. This countermeasure is included here as part of systematic range of options that are available to the District. New York City, London, and the closing of Pennsylvania Avenue provide examples of the implementation of perimeters. However, questions remain as to how to best integrate the measures installed as part of the perimeter and how to apply the principles of facilities protection to the establishment of a perimeter around the core area of a city.

Within the perimeter, a range of strategies is available to define its characteristics, including:

- ◆ Restrict truck access by route, permitted times, size of vehicle
- ◆ Identify vehicle, driver, contents
- ◆ Screen truck, driver, contents
- ◆ Detect explosive, nuclear, chemical, biological materials
- ◆ Detect unauthorized intruder vehicles
- ◆ Intercept and penalize unauthorized intruder vehicles

Again, **technology** exists to implement these countermeasures. Last year an unnamed European antiterrorism police agency purchased a high-tech mobile vehicle explosive detection system, where vehicles equipped with detectors can unobtrusively scan suspicious vehicles for the presence of explosives inside another vehicle. California's Department of Transportation implemented a \$20 million wireless surveillance system to transmit data from seven bridges and three tunnels in the San Francisco Bay area to a command center in Oakland. These examples suggest that truck security applications could consist of the following elements:

- ◆ Use of smart cameras to detect trucks in locations where they should be absent.
- ◆ Use of mobile explosive detection equipment to check out truck.
- ◆ Use of wireless technology

Any security area must be able to **defend itself** against unauthorized intruder vehicles that continue operating despite restrictions or orders to stop. Defense countermeasures are likely to be in the province of law enforcement; however, communications between transportation agencies are critical mitigate any casualties or damages as a result of the incident.

#### IV.10. Preliminary Security Recommendations

1. *Appoint a lead official within DDOT to coordinate the District's efforts for large truck security.* The lead may be within the proposed Motor Carrier Office. This official will work closely with the MPD (and other agencies) to implement a series of layered countermeasures. The Security Officer should have sufficient seniority to interact and

influence senior officials throughout the District government and within Federal agencies.

2. ***Create a technology demonstration, similar to the port and borders demonstrations, using resources from FMCSA, ITS JPO and TSA.*** An initial focus can be to create a virtual portal where trucks entering the District on the Georgia Avenue NE, Pennsylvania Avenue SE, New York Avenue NE corridors could be screened for proper credentials and for explosives or radioactive materials. Figure 9 shows the approximate location of the security portals. Some scanning for radioactive materials occurs at present; however, this effort would be analogous to the kinds of scanning currently being implemented at U.S. ports. Technology offers the opportunity to scan traffic without necessarily stopping it. This would only be a first step in creating a comprehensive strategy, as methods would need to be put in place to identify and intercept evaders.
3. ***Establish zones to aid planning and to define the layers of countermeasures and responses to be deployed.*** In coordination with Federal authorities and neighboring states, the District government can create a series of security zones surrounding the National Mall, the White House, and the Capitol Building. Over time, layered countermeasures and responses can be structured; with restrictions and other countermeasures based on the vulnerability and importance of potential targets within the zone. Zones closer to the National Mall area would have the strictest security measures, while those farther out would have progressively more lenient measures. Figure 9 shows the proposed zones, centered on the most secure red zone, and continuing outward with the yellow, purple, and gray zones, with an appropriate gradient of security measures between zones.
4. ***Restrict the transport of gasoline tankers into the yellow and red zones.*** There are a small number of gas stations located within the core security area of the yellow zone. Because of the sensitive nature of the targets in this area, the District should consider prohibiting gas tankers from entering the area. This would necessarily result in the closure of these gas stations. Alternatively, a strictly-enforced policy of nighttime-only deliveries can be instituted, allowing the gas stations to remain open.
5. ***Prohibit through-truck-traffic carrying hazardous materials from entering the District.*** Any hazardous materials being hauled within the District should emanate from or have a final destination in the city. Through-traffic of vehicles carrying hazardous materials merely passing through the District should be prohibited.
6. ***Enhance District regulations regarding the transport of hazardous material.*** At present, only a few specific types of hazardous materials require permits to be transported within the city. Further, the procedures that carriers must undergo to obtain the permits are not well publicized. The District government should implement a program for more closely permitting and monitoring hazardous material transport.

39

## V. MOTOR CARRIER OFFICE

One of the key recommendations of this study is the creation of a single office within DDOT to coordinate all motor carrier-related issues. At present, regulation and enforcement of motor carrier activities is handled by several different agencies within the Federal and District of Columbia governments. While this allows each agency to apply its own specialized security expertise, it also creates a confusing and disjointed regulatory environment. During interviews for this study, representatives from trucking firms and DC government agencies alike stated that they had at best an incomplete knowledge of who does what with respect to motor carrier operations in the District.

In order to gain a more complete understanding of the overall regulatory picture, flow charts mapping the processes for important truck-related procedures were prepared. Flow charts for the following processes are provided below:

- ◆ Commercial vehicle licensing
- ◆ Commercial driver licensing
- ◆ Washington, DC lawmaking
- ◆ Traffic and parking regulation and enforcement
- ◆ Weight and safety regulation
- ◆ Review of loading zones in for new development
- ◆ Construction mitigation

Even though these diagrams simplify some processes to highlight the important steps, a glance at them shows how complicated some of these processes are. During interviews conducted for this study, many commercial vehicle operators expressed frustration that they did not know how to navigate the maze of regulations and offices to, for example, get permission to temporarily close a lane of traffic to work on overhead utilities. In some processes, there seem to be extraneous steps, such as the DCRA issuing permits for oversize and overweight vehicles. Expertise on roadway geometry and condition rests in DDOT; it seems that permitting oversize and overweight vehicles should be its responsibility. Other processes are spread across different agencies, making coordination difficult. For example, parking policy is created in DDOT while parking enforcement is done by DPW. Careful coordination between policy and enforcement is important to get good policies and effective enforcement.

Some degree of complexity is inevitable and is not necessarily undesirable, since it allows each of the agencies to apply its specialized resources to specific motor carrier issues. However, the diagrams show areas where improvements could be made. There are opportunities for streamlining administration without sacrificing expertise. Moreover, the diagrams show that the several different motor carrier processes operate in isolation from one another. There is no single office or agency with a comprehensive understanding of all motor carrier issues; further, there is no single agency or office to help the freight industry navigate the administrative labyrinth in order to comply with all of the relevant regulations. The recommendations in this section are designed to address these issues.

Figure 10. Commercial Driver Licensing Process

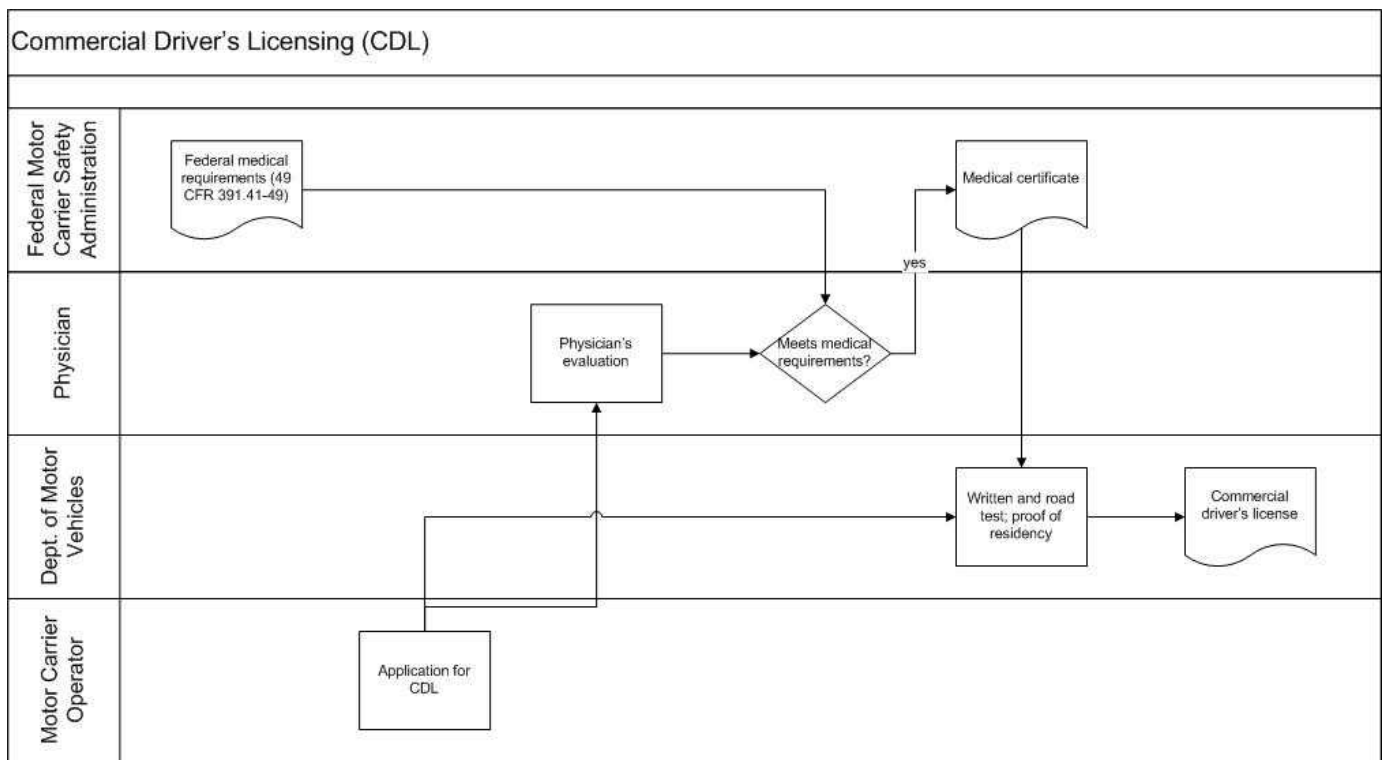


Figure 11. Commercial Vehicle Licensing Process

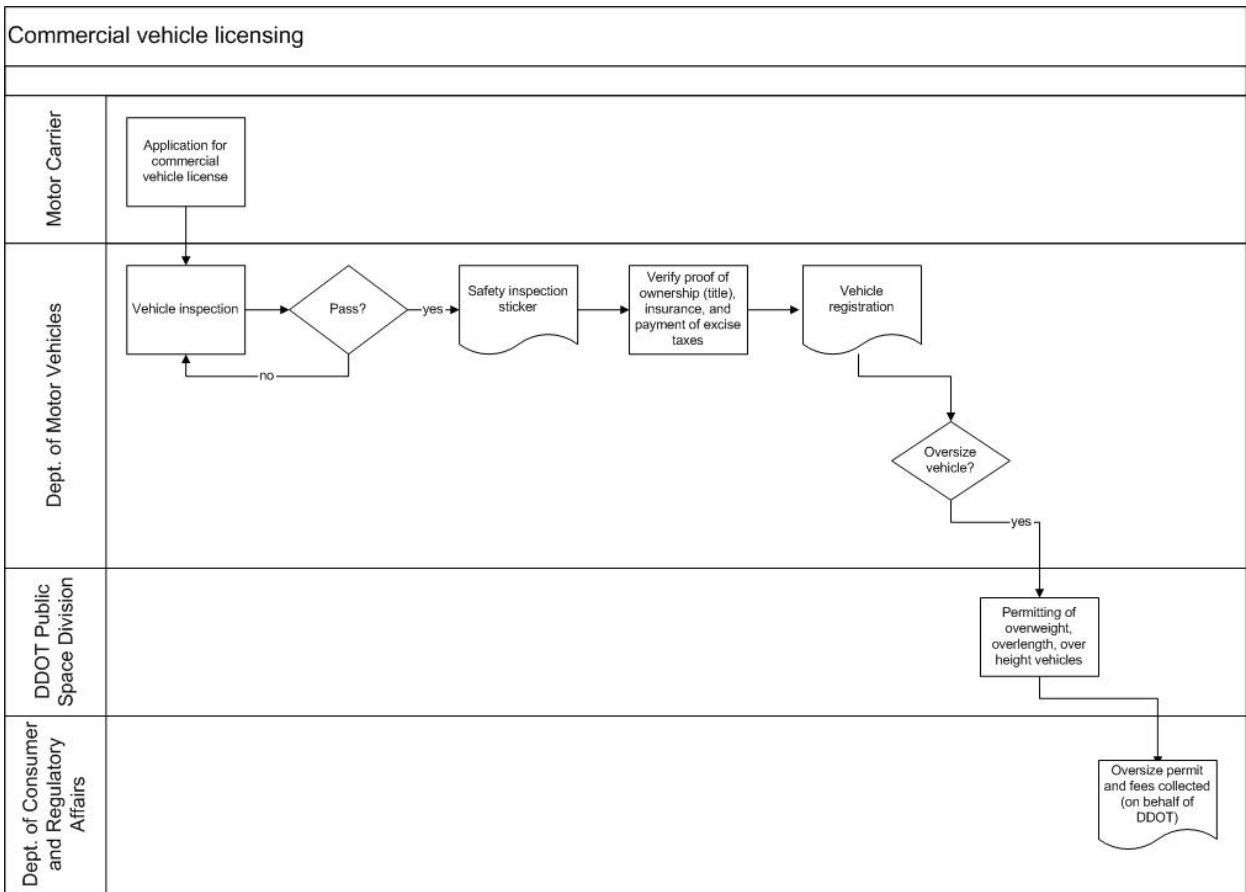
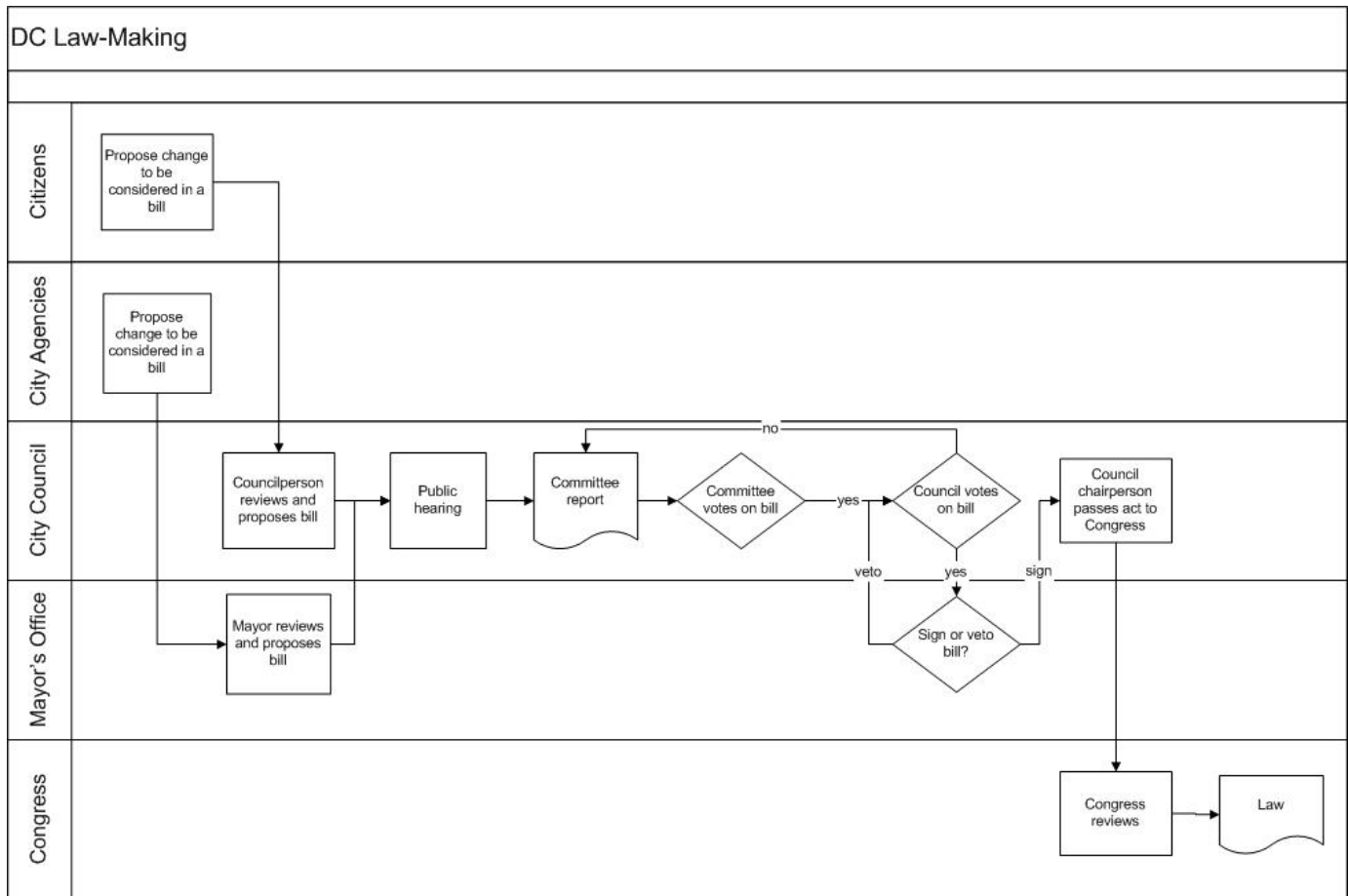
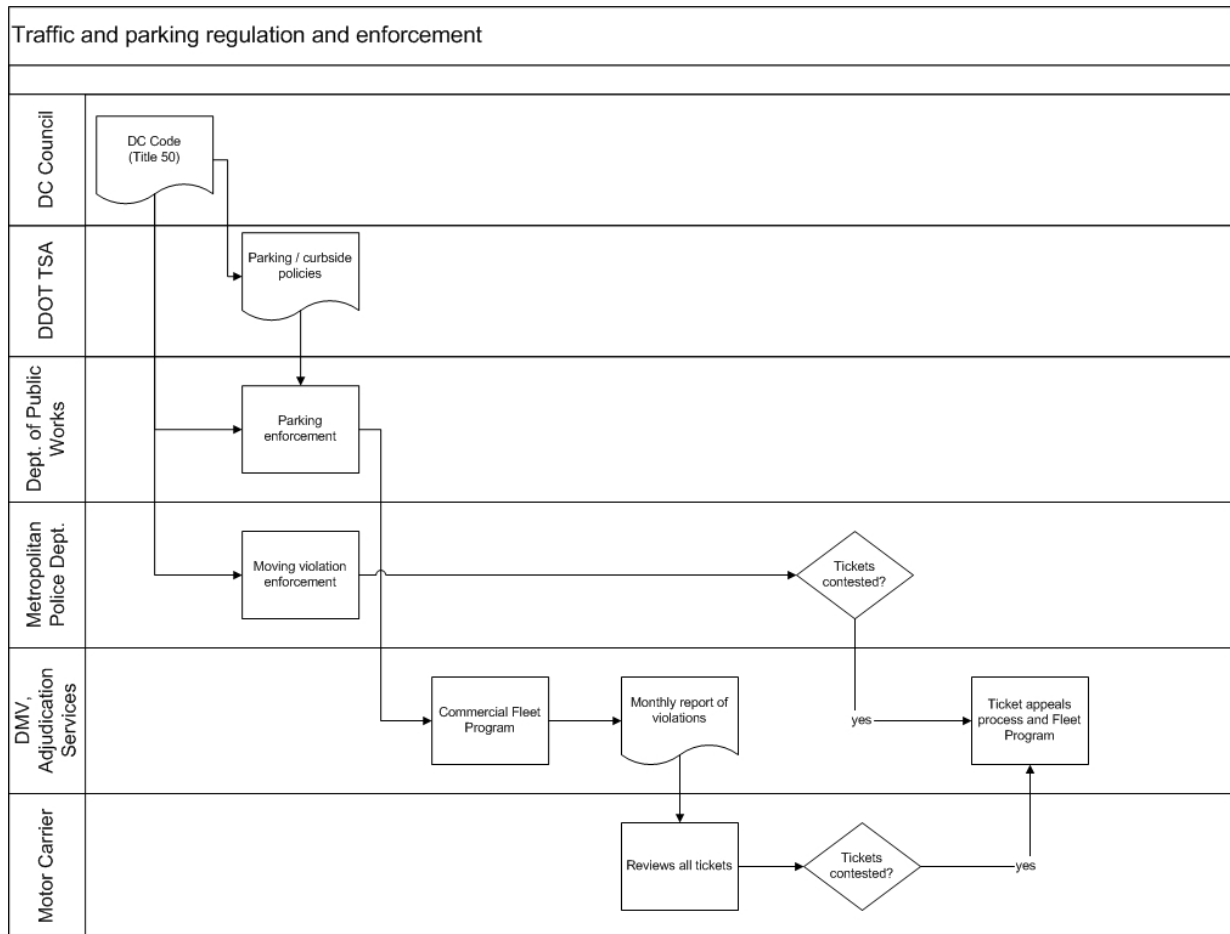


Figure 12. Washington, DC Law-Making Process



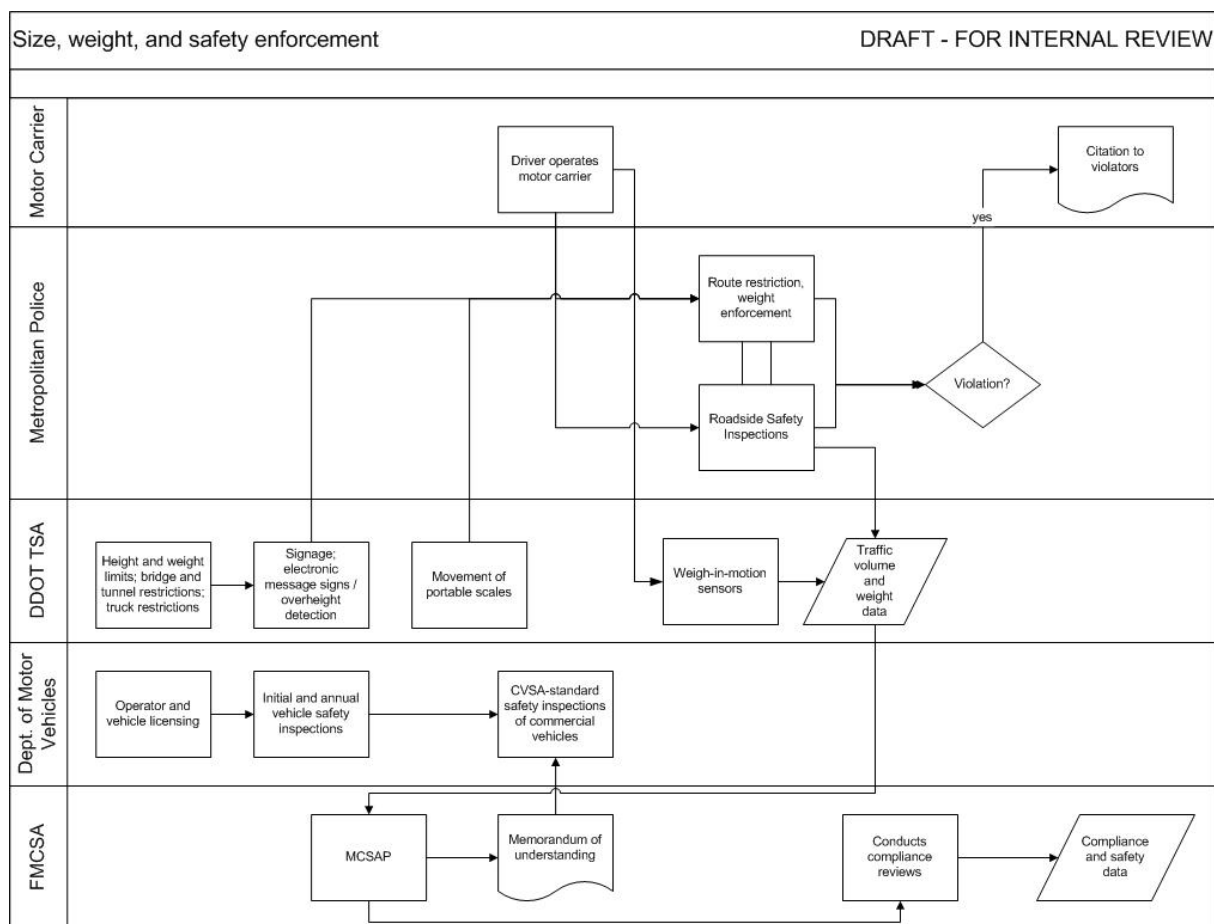
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**Figure 13. Traffic and Parking Regulation and Enforcement Process**



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Figure 14. Size, Weight, and Safety Enforcement



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**Figure 15. Review of Loading Zones in Development Plans**

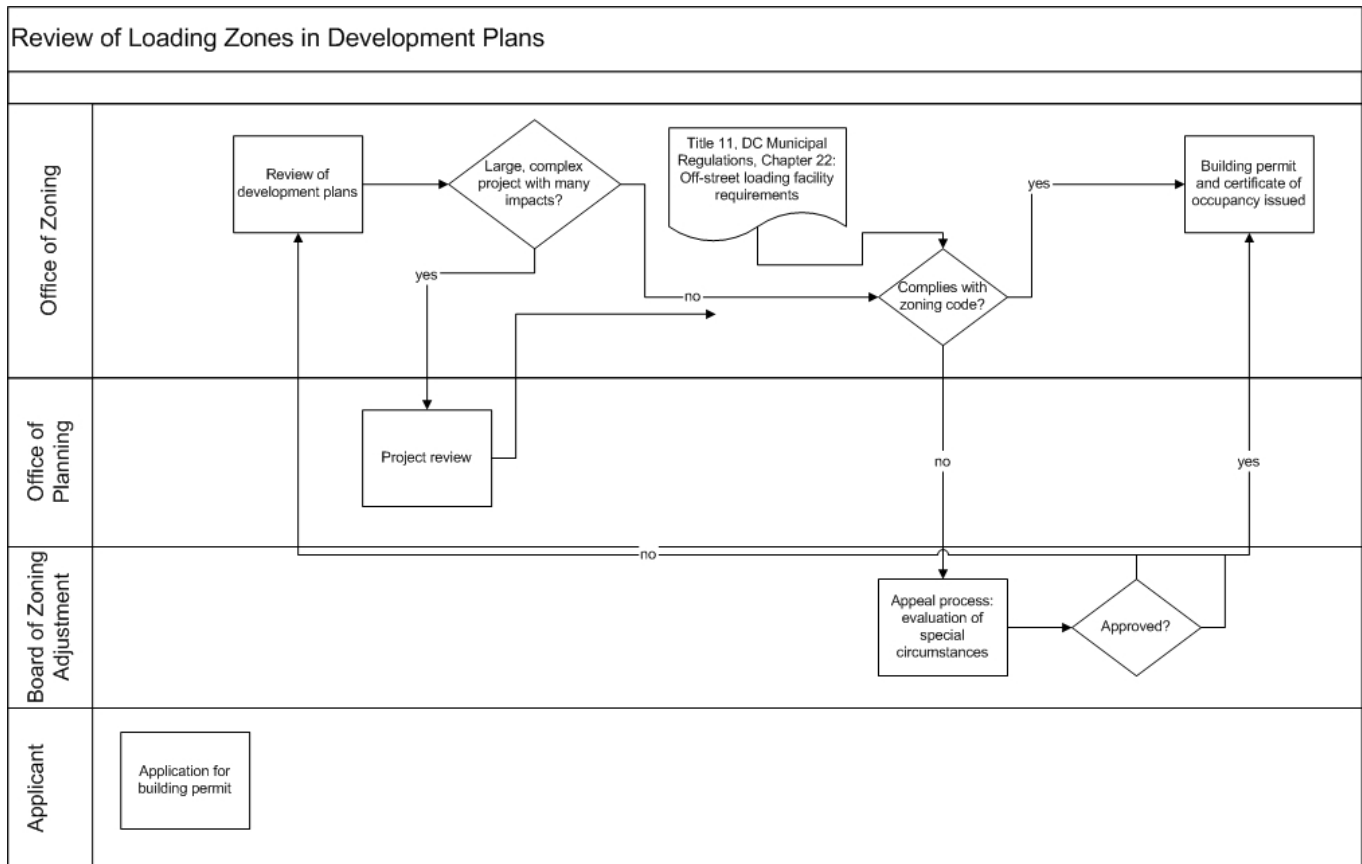
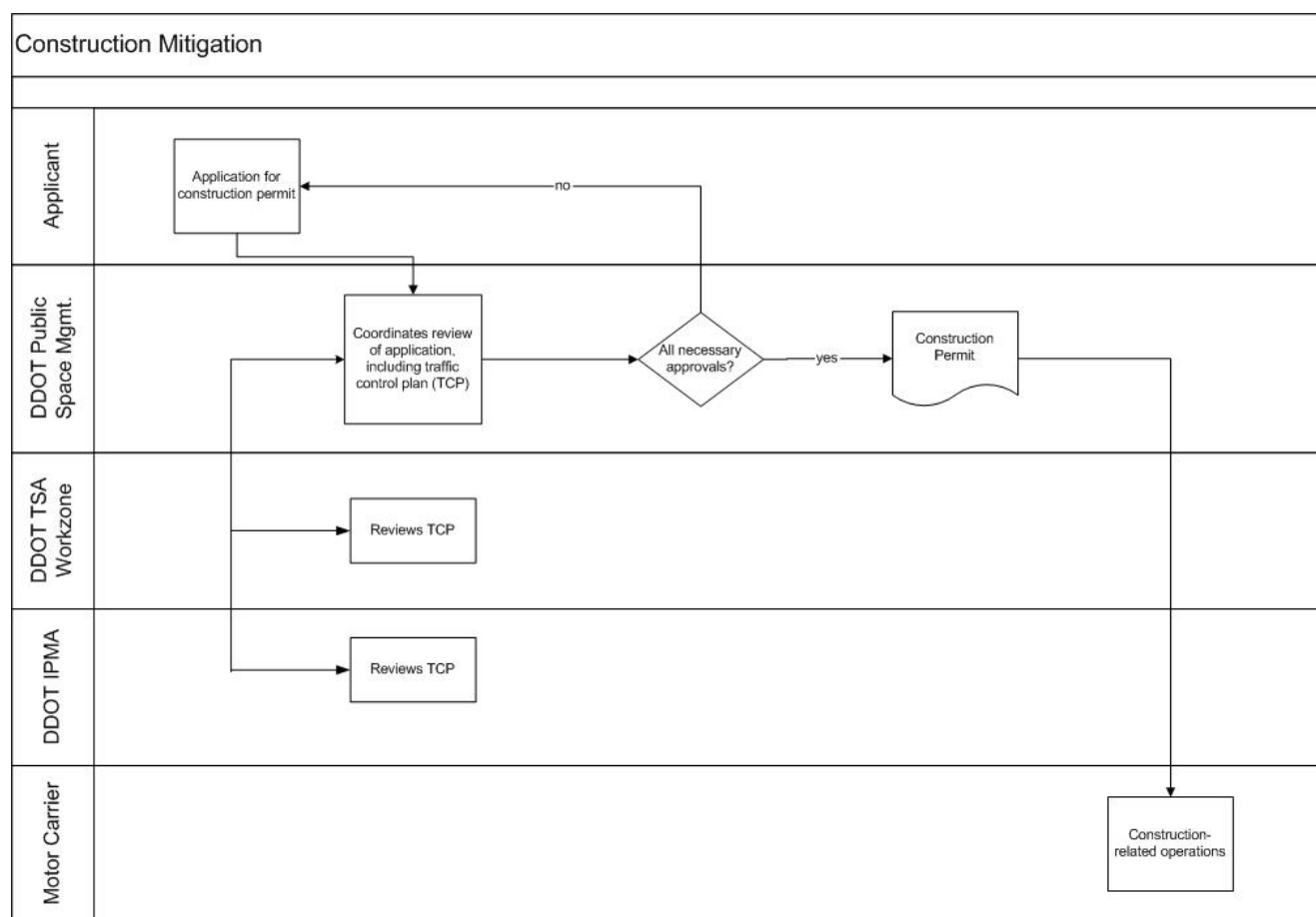


Figure 16. Construction Mitigation



## V.2. RECOMMENDATIONS FOR A MOTOR CARRIER OFFICE

It is recommended that a Motor Carrier Office (the exact name to be determined later, but abbreviated MCO here) be established within DDOT, with the following areas of responsibility:

- ♦ ***Serve as a single point of contact for motor carrier-related inquiries.*** The MCO would promote motor carrier safety and regulatory compliance by serving as a “one stop shop” for inquiries from the freight industry. This would include questions about such things as driver licensure, vehicle registration, routes and restrictions, size and weight limits, noise restrictions, and hazardous materials transport. The MCO would provide information and outreach materials through a combination of walk-in office hours, telephone lines, and a website portal. In most cases, the MCO would provide an overview of the relevant regulatory process and refer the caller to the appropriate agency. The MCO would also receive complaints and suggestions from residents and the business community on issues such as noise, parking, and routing. These would either be referred to the relevant agency or acted on directly, as appropriate.
- ♦ ***Staff the proposed multi-stakeholder Freight Committee.*** The Freight Committee would bring public and private sector representatives together to discuss issues related to motor carriers and develop mutually beneficial solutions. The MCO is the logical choice to be the city’s principal staff-level representative to this committee.
- ♦ ***Act as the lead office in designating preferred motor carrier routes and motor carrier restrictions.*** This function would be transferred from DDOT’s Traffic Services Administration (TSA) and the Infrastructure Project Management Administration (IPMA), and would include the formulation of restrictions related to routing, weight, time of day, and other factors. As part of this role, the MCO would also be responsible for commissioning and overseeing the engineering studies, stakeholder consultation, and other research necessary to develop these policies on routes and restrictions.
- ♦ ***Issue special permits for overweight and oversize vehicles.*** This function would be transferred from the DDOT Public Space Management Administration (PSMA) and the Department of Consumer and Regulatory Affairs, reducing the number of agencies with which the freight industry must interact. The MCO would be charged with developing, in consultation with PSMA and IPMA, appropriate criteria for evaluating applications and issuing the permits. This function might also entail coordination with the Department of Motor Vehicles (DMV), so that vehicle registration information could be reviewed at the time of permit processing.
- ♦ ***Work with the DDOT Chief Information Officer on motor carrier technologies.*** The MCO would oversee the research and development efforts on Intelligent Transportation Systems for Commercial Vehicle Operations (ITS/CVO) and other technologies related to truck and bus traffic.
- ♦ ***Work with DDOT’s TSA, IPMA, and other DDOT administrations on various issues relating to motor carrier traffic.*** This would include curbside management policies,

parking enforcement, the evaluation of construction-related traffic control plans, review of roadway construction plans, and other traffic management issues as appropriate.

- ♦ ***Coordinate with, and provide input to, other city agencies on motor carrier-related issues.*** Specifically, the MCO could:
  - Work closely with the MPD on noise regulations and particularly on size, weight, and safety enforcement. For example, the MCO could provide suggestions to the MPD on prioritizing enforcement locations.
  - Work with planning and zoning authorities to review development plans and ensure that proposed developments include adequate off-street loading areas.
  - Coordinate with the DMV on commercial driver licensing, vehicle registration, oversize vehicles, annual safety and emissions testing, and the adjudication of parking tickets. The DMV would retain responsibility for these functions.
  - Coordinate with the Department of Emergency Management, Fire & Emergency Medical Services, the Department of Health, and the MPD on issues relating to the transport of hazardous waste and materials, explosives, radioactive materials, and on emergency management and evacuation procedures.
- ♦ ***Coordinate with other public-sector bodies as appropriate.*** This could include assisting the Capitol Police, the Federal Department of Homeland Security, and other agencies on security matters. The MCO would also work with agencies of the Federal Department of Transportation on compliance reviews (Federal Motor Carrier Safety Administration) and hazardous materials (Research and Special Programs Administration). Regional coordination on motor carrier issues could also be established with the Metropolitan Washington Council of Governments, and with representatives from Maryland, Virginia, and nearby counties and cities.
- ♦ ***Identify and manage motor carrier management funding sources.*** This would include establishing fees for motor carrier licensing, registration, and permits, as well as penalties and fines for motor carrier program violations. Funds generated by the MCO could be retained to pay the cost of implementing and enforcing the program.

As stated above, most District agencies would retain their current motor carrier functions. Specifically, the DMV would continue to handle operator licensing, vehicle registration, annual safety and emissions inspections, and the adjudication of parking tickets, including the Fleet Program that allows owners of commercial vehicle fleets to pay their parking tickets once a month. Planning and zoning authorities would continue to operate as before, except for their new coordination with the MCO on off-street loading areas. The MPD would retain all of its enforcement powers but would also coordinate with the MCO on motor carrier enforcement and on noise complaints related to motor carrier operations. Likewise, the Department of Emergency Management and other public safety agencies would retain all of their responsibilities, though, again, they would be assisted by the MCO as appropriate.

One recommended change to the status quo is to transfer responsibility for the enforcement of parking regulations from the Department of Public Works to DDOT's TSA. Placing policy and

enforcement within the same agency may simplify administration, allow parking policy to be adjusted more nimbly in response to observed changes on the streets, and reduce errors caused by miscommunication between agencies.

Funding for the MCO will be commensurate with the office's responsibilities. Specific recommendations on funding and staffing will be addressed in a subsequent study.

## VI. RECOMMENDATIONS MATRIX

This recommendations matrix presents a concise summary of major options for the creation of a truck management program. The matrix is designed to aid planning and policy-making by identifying the truck-management strategies that are applicable in the short, medium, and long terms. Each recommendation is also rated on its likely impact on District residents and businesses, and on the freight industry, the environment, and safety and security. This evaluation is subjective, and many of the recommendations have the potential for a range of both positive and negative effects. Furthermore, several of the recommendations, such as building a tour bus layover facility or formulating an aggressive region-wide strategy to fight traffic congestion, would require significant additional study and public consultation before implementation. The matrix evaluates the recommended actions for their impact on the following:

### Residents

- ◆ Reduction in the presence of trucks on residential streets, including a reduction in the noise and vibration caused by some types of trucks.
- ◆ Reduction in truck-generated congestion on residential streets, including inappropriate and illegal parking by trucks.
- ◆ Improvement in compliance with new and existing regulations.

### Businesses

- ◆ Improvement in loading and unloading facilities available for trucks serving local businesses.
- ◆ Improvement of truck-oriented roadways, including designated truck routes.
- ◆ Rationalization of the regulatory structure within which businesses must operate in order to receive or use trucking services.
- ◆ Reduction in congestion, including inappropriate and illegal parking by trucks.
- ◆ Encouragement of economic development through improvement of the business climate.
- ◆ Improvement in compliance with new and existing regulations.

### Freight Industry

- ◆ Improvement in the loading and unloading facilities available for trucks.
- ◆ Creation or improvement of truck-oriented facilities, including distribution facilities and truck stops.
- ◆ Improvement of truck-oriented roadways, including designated truck routes.
- ◆ Rationalization of the regulatory structure within which trucking companies operate.
- ◆ Reduction in congestion, including inappropriate and illegal parking by trucks.
- ◆ Improvement in compliance with new and existing regulations.

### Environment

- ◆ Reduction in truck-generated impacts on the human and natural environments, including congestion, idling, and inappropriate or illegal parking, noise, and vibration.
- ◆ Improvement in compliance with new and existing regulations.

### Safety and Security

- ◆ Reduction in the potential for trucks or truck-borne weapons to cause damage or injury.
- ◆ Improvement in compliance with new and existing regulations.

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**Table 3. Institutional Transparency, Coordination, and Leadership Recommendations Matrix**

Strategy 1. Institutional Transparency, Coordination, and Leadership	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	1. Establish a single office within DDOT to be the point of contact for motor carriers issues	+	++	++	++	+	Short-term
	2. Form a multi-stakeholder advisory committee dedicated to freight issues.	+	++	++	++	+	Medium-term
	3. Create an on-going program of data collection to document trucking activities in the District, including vehicle types and classifications, routes, hours, and patterns of operations.	+	+	+/-	+/-	++	Medium-term
	4. Investigate the costs and benefits of joining the International Fuel Tax Agreement.	N	N	+	+	N	Medium-term
	5. Create a program to fund small, quick-fix projects.	+	++	++	++	+	Medium-term

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**Table 3. Institutional Transparency, Coordination, and Leadership Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	6. Conduct a comprehensive campaign of education and outreach including updated and new truck rules and regulations.	+	++	++	++	+	Medium-term
	7. Develop a master plan for the long-term, regional needs of freight movement.	+	++	++	++	+	Long-term
	8. Transfer parking enforcement responsibility from DPW to DDOT in order to unite enforcement and policy.	+	+	+	+	N	Medium-term

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**Table 4. Routes, Restriction, and Enforcement Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
<b>Strategy II</b> <b>Routes, Restrictions, and Enforcement</b>	1. Step up enforcement of overweight trucks.	+	+/-	+/-	+	+	Short-term
	2. Ensure that signing of routes and restrictions is clear.	+	+/-	+	N	+	Short-term
	3. Work with Maryland and Virginia on cross-border mismatches.	+	+	+	+	+	Medium-term
	4. Increase fines for over weight trucks and parking violations.	N	N	+/-	+	+	Medium-term
	5. Identify and implement preferred routes for truck traffic, preferably routes near established areas of industrial, port, or other truck-dependent activities.	+/-	+	+	+/-	+	Long-term
	6. Improve roadways designated as truck routes if necessary.	N	+	++	+	+	Long-term
	7. Perform additional research in residential neighborhoods and downtown locations with identified truck problems.	+	+/-	+/-	+	+	Long-term
	8. Create a permitting process to allow exceptions to truck route designations and restrictions as needed.	+/-	+	++	N	-	Long-term

**Table 5. Congestion Management and Coordination Recommendations Matrix**

Strategy III Congestion Management and Coordination	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	1. Develop a system through which the MPD and DDOT can be more proactive about alerting truck operators to major traffic disruptions such as demonstrations and construction-related road closures.	+	+	+	+	+	Medium-term
	2. Require the development and enforcement of a truck management plan for all major construction sites.	++	+	+/-	+	+	Medium-term
	3. Cooperate with Federal agencies and other institutions to standardize and coordinate their security procedures.	N	N	+	+	+/-	Long-term
	4. Collaborate with the Metropolitan Washington Council of Governments on regional solutions to the traffic congestion problem.	++	++	++	++	N	Long-term

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**Table 6. Curbside Management Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
<b>Strategy IV Curbside Management</b>	1. Improve enforcement of “no stopping” and “no parking” regulations, especially in areas reserved for loading zones and in alleyways.	++	++	++	++	+	Short-term
	2. Increase fines for parking violations.	+/-	+	+/-	+	N	Medium-term
	3. Extend peak period no-parking restrictions to 11 a.m. in some areas.	+/-	+/-	++	N	N	Medium-term
	4. Improve signing of curbside restrictions.	+	N	+	N	N	Medium-term
	5. Install meters in loading zones to encourage expeditious use and to allow for peak-period pricing.	N	+	+/-	+	N	Medium-term
	6. Facilitate the parking of vehicles from utility companies on residential streets when servicing residences or equipment located on that street.	+/-	+	+	N	+/-	Medium-term
	7. Relocate loading zones to the corners so that trucks do not have to parallel park.	N	+	++	N	+	Long-term

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**Table 6. Curbside Management Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	8. Promote nighttime deliveries in non-residential sections of the downtown.	N	+/-	+/-	+	+/-	Long-term
	9. Work with the owners and operators of facilities that generate significant truck traffic—warehouses, factories, distribution centers, and major retailers—to develop plans for improving the efficiency of their individual truck activities. Encourage the coordination of delivery times at large complexes, and ensure that big events have a truck management plan.	+	+/-	+	++	+	Long-term
	10. Review curbside restrictions block-by-block and ensure that there is at least one usable loading zone per block in the downtown and Dupont Circle areas and the commercial section of Georgetown.	N	++	++	+	+	Long-term

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**Table 6. Curbside Management Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	11. Require that all new commercial construction include sufficient off-street loading areas to accommodate all present and future truck traffic.	++	++	++	++	+	Long-term
	12. Re-examine the city's solid waste collection policy with an eye toward reducing the number of garbage trucks on the streets each day, especially during the morning peak period.	+/-	+	+/-	+	+	Long-term
	13. Re-examine the city policy on alleyways, with the goal of stemming the losses of off-street loading spaces.	N	+/-	++	+	+	Long-term
	14. Investigate the use of an ITS-based central traffic management system to monitor and control traffic in the urban core.	+	++	++	++	++	Long-term
	15. Consider creating a program for courier services to purchase exclusive rights to certain parking spots during their peak demand hours.						

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**Table 7. Security Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
<b>Strategy V Security</b>	1. Educate truck and bus drivers and the public to recognize suspicious activity.	+	+	+	N	++	Short-term
	2. Continuously update identification of all assets within the city that need protection from truck-borne threats.	+	+	N	N	++	Medium-term
	3. Improve and publicize procedures for permitting the transport of hazardous materials.	+	+/-	+/-	++	++	Medium-term
	4. Prohibit vehicles carrying hazardous materials from entering the District if they do not have a destination in the city.	+	+	-	+	++	Medium-term
	5. Create an on-going program of security-oriented data collection to document trucking activities in the District, including vehicle routes, hours, and patterns of operations, hazardous materials terminals, and facilities-at-risk.	N	N	+/-	N	++	Medium-term

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**Table 7. Security Recommendations Matrix**

	Recommended Action	Likely Impact on					Timeframe
		Residents	Businesses	Freight Industry	Environment	Safety and Security	
	6. Investigate participation in demonstration projects and tests of advanced technology related to truck security.	N	+	+	N	++	Medium-term
	7. Establish policies for coordination with federal and neighboring state agencies to address truck-borne threats.	+	+	+	N	++	Long-term
	8. Integrate truck security measures with truck control strategies for other purposes.	+	+	+	N	++	Long-term
	9. Consider establishing zones with security precautions commensurate with the level of security required within the zone.	+/-	-	-	+/-	++	Medium-term
	10. Prohibit gasoline tankers from entering sensitive areas, especially around important government or symbolic sites.	N	-	-	+	++	